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NQA 06-043

November 7, 2006

U.S. Nuclear Regulatory Commission  
Attn.: Document Control Desk  
Washington, DC 20555

Docket No. 50-312  
Rancho Seco Nuclear Generating Station  
License No. DPR-54

**ENVIRONMENTAL DOCUMENTS TO SUPPORT LICENSE TERMINATION PLAN  
REVIEW**

Attention: John Hickman

Attached is a copy of the documents you requested to support the preparation of the environmental assessment for the Rancho Seco License Termination Plan (LTP). The attached documents include:

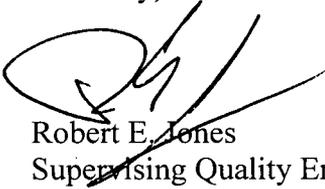
1. "Supplement to Rancho Seco Environmental Report - Post Operating License Stage," 1991.
2. Biological surveys performed on the site including the 1994 survey that was part of the Master Plan for development of Rancho Seco Park and the biological survey conducted in support of the Cosumnes Power Plant.
3. Cultural resources survey performed in support of the Cosumnes Power Plant.
4. NPDES Permit including the renewal application.
5. Our contract with the U.S. Bureau of Reclamation.

We do not have an agreement with the County of Sacramento regarding the operation Rancho Seco Park nor do we have any permits from the Army Corp of Engineers to dredge, discharge, or deposit materials into navigable waters or their tributaries.

NMSSO1

Members of your staff with questions requiring additional information or clarification may contact me at (916) 732-4843.

Sincerely,



Robert E. Jones  
Supervising Quality Engineer

Attachment

Cc w/ attachment: B.S. Mallett, NRC, Region V



SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, P.O. Box 15830, Sacramento CA 95852-1830, (916) 452-3211  
AN ELECTRIC SYSTEM SERVING THE HEART OF CALIFORNIA

AF 91102302

DAGM/NUC 91-0136

October 21, 1991

U. S. Nuclear Regulatory Commission  
Attn: Director of Nuclear Reactor Regulation  
Washington, DC 20555

Docket No. 50-312  
Rancho Seco Nuclear Generating Station  
License No. DPR-54  
**SUPPLEMENT TO RANCHO SECO ENVIRONMENTAL REPORT - POST OPERATING  
LICENSE STAGE**

Attention: Thomas E. Murley

In accordance with the requirements of 10 CFR 51.53(b), the District hereby submits its Supplement to Rancho Seco's Environmental Report - Post Operating License Stage. This report provides an assessment of the environmental effects of decommissioning Rancho Seco, and provides a comparison of those impacts with the NRC's Generic Environmental Impact Statement (GEIS), NUREG-0586.

The report concludes that the decommissioning attributes for Rancho Seco fall within the envelope of the GEIS, and that the environmental effects of decommissioning Rancho Seco are not significant, given the mitigation measures proposed in the report.

Members of your staff with questions requiring additional information or clarification may call Ken Miller at 916/452-3211, extension 4513.

Sincerely,

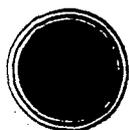
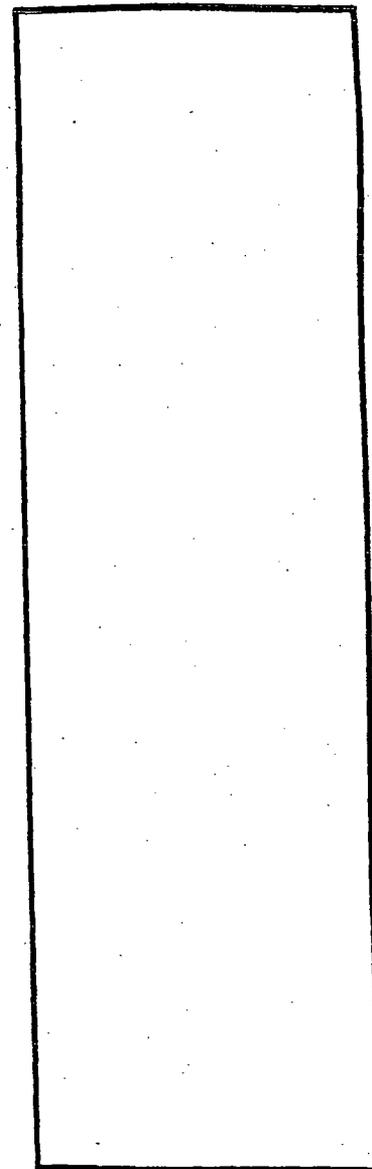
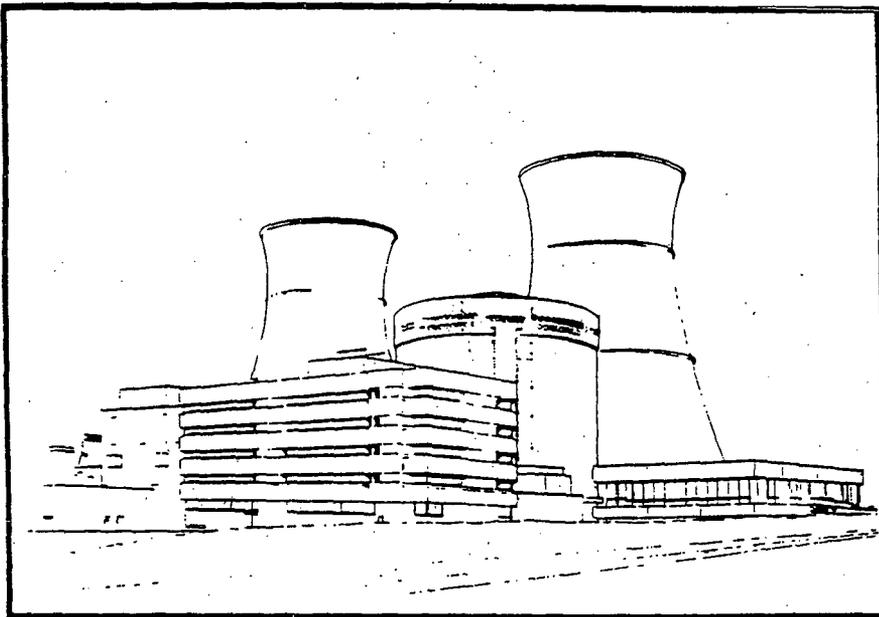
A handwritten signature in cursive script that reads "James R. Shetler".

James R. Shetler  
Deputy Assistant General Manager  
Nuclear

cc: J. B. Martin, NRC, Region V  
C. Myers, NRC, Rancho Seco  
Seymour Weiss, NRC, Washington, DC

**SUPPLEMENT TO APPLICANT'S  
ENVIRONMENTAL REPORT -  
POST OPERATING LICENSE STAGE**

**RANCHO SECO NUCLEAR GENERATING STATION**



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**SACRAMENTO MUNICIPAL UTILITY DISTRICT**

**SUPPLEMENT TO RANCHO SECO ENVIRONMENTAL REPORT --  
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CHAPTER 1

INTRODUCTION

1.1 PURPOSE

Because of a public vote on June 6, 1989, the Sacramento Municipal Utility District (District) decided to shut down the Rancho Seco Nuclear Generating Station (RSNGS). Accordingly, on August 29, 1989, the District notified the Nuclear Regulatory Commission (NRC) of its intent to seek amendments to the RSNGS operating license and decommission the facility. The NRC acknowledged this notification on November 27, 1989.

The purpose of decommissioning Rancho Seco is to allow the facility to be taken safely from service and to reduce the residual radioactivity to a level that permits the release of the site for unrestricted use and termination of the operating license. The District has selected the SAFSTOR option for decommissioning Rancho Seco. A discussion of other decommissioning alternatives examined, and the reasoning for selecting SAFSTOR with Deferred-DECON, is provided in Chapter 6.

In accordance with 10 CFR 51.53(b), the District submits this Supplement to the Rancho Seco Environmental Report- Post Operating License Stage. This environmental report addresses the actual or potential environmental impacts associated with Custodial and Hardened-SAFSTOR, and provides an initial assessment of the effects of Deferred-DECON. The environmental impacts associated with Deferred-DECON will be further evaluated after the District develops detailed plans for Deferred-DECON, towards the end of the Hardened-SAFSTOR dormancy stage.

In accordance with the California Environmental Quality Act (CEQA), the District has also conducted an initial study of the potential environmental impacts resulting from closing and decommissioning Rancho Seco. Based on the results of that study, the District staff has prepared a Negative Declaration stating that decommissioning would not have a significant environmental impact.

In addition to the environmental impacts associated with the District's proposed radiological decommissioning activities, the CEQA study addresses additional potential environmental impacts associated with other plant closure activities. These additional environmental impacts are outside the scope of proposed decommissioning activities and are therefore outside the NRC's scope of review under the National Environmental Policy Act (NEPA).

**SUPPLEMENT TO RANCHO SECO ENVIRONMENTAL REPORT --  
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The CEQA report has previously been sent to the NRC for review and comment.

SUPPLEMENT TO RANCHO SECO ENVIRONMENTAL REPORT --  
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1.2 DECOMMISSIONING PLAN DESCRIPTION

1.2.1 Description of SAFSTOR Alternative

Under SAFSTOR with Deferred-DECON, Rancho Seco will be maintained in a dormant condition that allows the facility to be safely stored and subsequently decontaminated (Deferred-DECON) to levels that permit its release for unrestricted use.

The Rancho Seco Decommissioning Plan (DP) details the District's decommissioning strategy using the SAFSTOR alternative. This strategy includes the following three stages:

1. Custodial-SAFSTOR, where the spent fuel is stored in the spent fuel pool.
2. Hardened-SAFSTOR, which will be implemented after the fuel has been moved into dry storage at the Independent Spent Fuel Storage Installation.
3. Deferred-DECON, which involves decontamination and dismantlement of the facility.

The District has determined the SAFSTOR alternative provides for reasonably prompt license termination considering the limitations of spent fuel storage, waste disposal, occupational exposure, and funding. The Custodial and Hardened-SAFSTOR portions of this alternative reasonably ensure the protection of public health and safety from residual radioactivity remaining at the site without the need for extensive modifications to the facility.

During SAFSTOR, the facility will be left intact with structures maintained in a sound condition. Systems not required to be operational for maintenance and surveillance purposes are drained, de-energized, and secured. Plant staff will perform minimal cleaning or removal of loose radioactive contamination and/or fixation and sealing of remaining contamination. Access to contaminated areas is sealed and/or secured to provide controlled access for inspection and maintenance.

SAFSTOR Duration

The SAFSTOR duration is based on initiating decontamination activities approximately 20 years after shutdown, removing radioactive materials from the site, and completing license termination. The site will then be available for unrestricted and/or alternative use. Initially, the District will place

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the facility in Custodial-SAFSTOR until the spent fuel is transferred to dual-purpose (storage/transport) casks, by approximately 1998. The District will maintain Hardened-SAFSTOR until the start of Deferred-DECON.

SAFSTOR Activities

Activities required during SAFSTOR include a 24-hour guard force; preventive and corrective maintenance on required security systems, area lighting, and general building maintenance; ventilation of buildings; routine radiological inspections of contaminated buildings; maintenance of structural integrity; and an environmental, radiation monitoring, and chemistry program.

The District will conduct an environmental surveillance program during SAFSTOR to ensure that releases of radioactivity to the environment are monitored, and that such releases are identified and quantified. The environmental surveillance program will be a modified version of the program implemented during normal plant operations. In addition, appropriate emergency procedures will be implemented for releases that exceed prescribed limits.

Deferred-DECON

At the end of the SAFSTOR dormancy period, the District will decontaminate or dismantle remaining contaminated structures. Because this alternative provides a period of decay for the residual radioactivity, personnel radiation exposures will be lower than those incurred with the DECON alternative. By dismantling contaminated facilities at the end of SAFSTOR dormancy, improved decommissioning technology may be available.

SAFSTOR results in reduced occupational radiation exposures, consistent with the principles of maintaining personnel exposures As Low As Reasonably Achievable (ALARA); minimizes the Curie content of radioactive waste; and allows time to collect funds for decommissioning activities.

**SUPPLEMENT TO RANCHO SECO ENVIRONMENTAL REPORT --  
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1.2.2 Justification for SAFSTOR Alternative

A major reason for selecting the SAFSTOR option was to permit Cobalt-60 and other short-to-intermediate half-life radioisotopes to decay to levels that will reduce occupational exposure during Deferred-DECON. NUREG/CR-0130 "Technology, Safety, and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station" supports the District's assessment of the health and environmental implications, and indicates substantial dose reduction due to decay during the safe storage stage. The public radiation dose, which will be small for any decommissioning option, will also be reduced mainly during the first 10 to 20 years of storage.

In addition, the District believes that DOE will not be able to take possession of Rancho Seco's spent nuclear fuel until after 2008. The earliest forecast date for DOE possession of our spent fuel is after 1998, based on the availability of a Monitored Retrievable Storage (MRS) facility. However, because of our place in the queue and historical siting problems with the repository, our plans assume DOE possession of spent fuel after 2008. In our Decommissioning Plan we proposed to keep spent fuel in the spent fuel pool until approximately 1998, and then transfer the fuel to dual-purpose casks.

During the time spent fuel is in the spent fuel pool, partial decontamination and dismantlement of the balance of plant, in particular the Reactor Building, could put the spent fuel at risk. Partial decommissioning would also result in additional costs to the District because of the additional equipment and staff required to decontaminate and dismantle the Fuel Storage Building after the spent fuel has been transferred to dual-purpose casks.

Also, an onsite transfer facility may be required throughout dry storage of the spent fuel in the event that the dual-purpose casks require service. The transfer facility may also be required for potential loading of spent fuel into DOE's transportation casks. Accordingly, we have selected the Fuel Storage Building and the Reactor Building as potential cask servicing and spent fuel transfer facilities. The availability of these buildings may be required until after DOE accepts spent fuel and therefore, precludes their early decommissioning.

Occupational exposure will be reduced due to radioactive decay, the subsequent risk of accidents can be reduced, and improved decommissioning technology could be realized by starting decontamination and demolition activities at the end of spent fuel storage.

**SUPPLEMENT TO RANCHO SECO ENVIRONMENTAL REPORT --  
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Because of the need for continued onsite spent fuel storage, and the other reasons described, the District concluded that decontamination and dismantlement of Rancho Seco will not commence until after 2008, and therefore, SAFSTOR is the most appropriate decommissioning alternative.

# RANCHO SECO LONG RANGE PLAN (Proposed)

91-0041

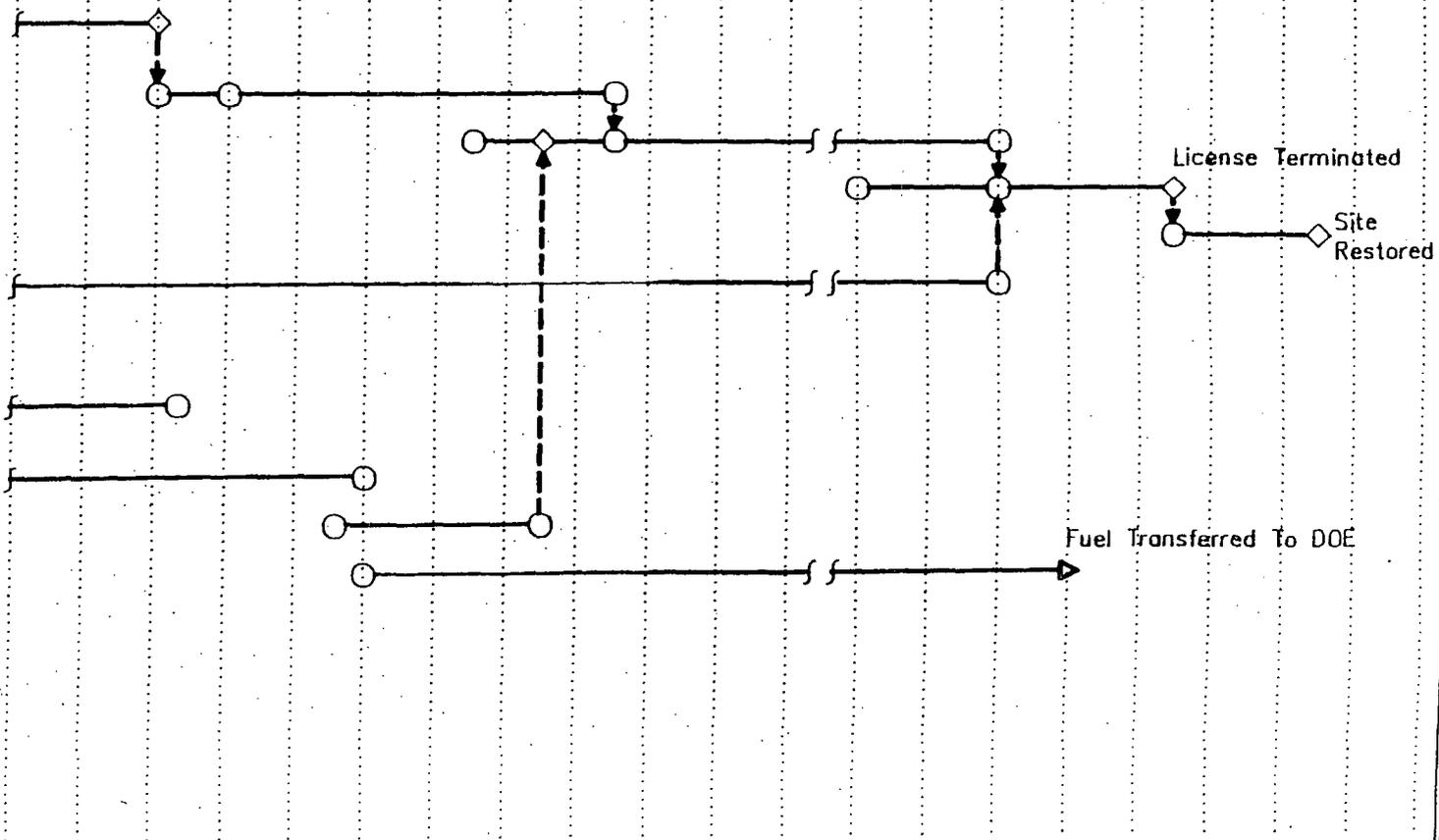
PLANT PERSONNEL	SMUD Security	230	175	115	72	72	72	72	72	72	8	8			12	24	24	24	12	8	8	0
		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001			2007	2008	2009	2010	2011	2012	2013	2014
		80	40	40	40	40	40	40	40	40	17	17			17	25	25	25	10	7	7	0

## DECOMMISSIONING:

- Decommissioning Plan Preparation/Approval
- Custodial SAFSTOR
- Hardened SAFSTOR
- Deferred DECON
- Site Restoration
- Funding Period

## FUEL DISPOSAL:

- Design/license/Construct ISFSI
- DOE Demo Project
- Load Remaining Casks
- Cask Storage/Monitoring



**SUPPLEMENT TO RANCHO SECO ENVIRONMENTAL REPORT --  
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**1.3 REGULATORY CONSIDERATIONS**

The District will conduct the decommissioning of Rancho Seco in compliance with all applicable regulations. Radiation exposures to plant personnel and the public will be controlled and monitored in accordance with the Radiation Protection Program and 10 CFR 20. The storage, shipment, and disposal of radioactive waste will be governed by 10 CFR 72, 10 CFR 61, 10 CFR 71, and appropriate portions of 49 CFR.

The District will implement the Rancho Seco SAFSTOR Quality Assurance program to monitor decommissioning activities and ensure compliance with appropriate regulations as decommissioning proceeds. A complete list of applicable regulations is provided in Section 1.7 of the DP.

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1.4 DECOMMISSIONING ORGANIZATION

The key positions in the SAFSTOR decommissioning organization are shown in Figures 2-20 and 2-21 of the DP. The General Manager is the District's Chief Executive Officer and is involved in the oversight of decommissioning activities. The District's Board of Directors are the policy-making body who have ultimate responsibility for the RSNGS operating license. The Deputy Assistant General Manager (DAGM), Nuclear has the ultimate authority onsite. In the DAGM's absence, this authority will pass to the Nuclear Plant Closure Manager (CM).

To the extent practicable, the initial decommissioning organization will consist of the operations and maintenance staff at RSNGS, to capitalize on their detailed knowledge of, and familiarity with, the facility. The District will contract specialists and consultants, as required, to assist and supplement the decommissioning staff. Preparation for Hardened-SAFSTOR, Deferred-DECON, and site restoration may be performed by specialty contractors.

Management personnel will meet or exceed the minimum qualifications for education, training, and experience outlined in ANSI N18.1-1971 for comparable positions. Review committee members will meet or exceed the minimum qualifications of ANSI/ANS 3.1-1981, Section 4.7.2.

The District may employ specialty contractors to perform special services during decommissioning. Contractors may be used to increase the overall effectiveness of the project by providing the efficiency of specialty operations and by reducing the need for specialized staff training. During Deferred-DECON and site restoration, the District will employ a Decommissioning Operations Contractor (DOC) to perform primary decommissioning services.

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**1.5 NEED FOR PROPOSED ACTION**

Shortly after the June 7, 1989, decision to shutdown RSNGS, the District created a Decommissioning Task Force to focus efforts on placing the plant in a protective lay-up condition and to initiate planning for decommissioning. The District selected the SAFSTOR decommissioning alternative because SAFSTOR provides for reasonably prompt license termination considering the limitations of spent fuel storage, waste disposal, occupational dose, and funding.

The SAFSTOR alternative ensures protection of public health and safety from residual radioactivity remaining at the site without the need for extensive modifications to the facility. The facility will be left intact with structures maintained in a sound condition. Systems not required to be operational for maintenance and surveillance purposes are drained, de-energized, and secured. Plant staff will perform minimal cleaning or removal of loose contamination and/or fixation and sealing of remaining contamination. Access to contaminated areas will be sealed and/or secured to provide controlled access for inspection and maintenance.

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**1.6 SUMMARY OF ENVIRONMENTAL IMPACTS OF DECOMMISSIONING**

The Nuclear Regulatory Commission (NRC) has issued NUREG-0586 "Final Generic Environmental Impact Statement on decommissioning of nuclear facilities" (GEIS), which provides a generic environmental assessment of decommissioning a reference nuclear facility. When the NRC issued the Decommissioning Rule in 1988, and based on the findings in the GEIS, it concluded a generic finding of "no significant (environmental) impact." The NRC further concluded that no additional EIS need be prepared in connection with the decommissioning of a particular nuclear site unless the impacts of a particular plant have site-specific considerations significantly different from those studied generically.

**GENERAL**

The attributes of the prematurely shutdown plant would fall below the "end-of-life" envelope established in the GEIS. Although RSNCS operated for about 14 years, its reactor had only approximately six full power effective years on the nuclear core. Therefore, the irradiated components of RSNCS would fall within the bounds of the GEIS reference facility that had operated over its 40 year design life.

The purpose of this section is to compare RSNCS decommissioning attributes to those attributes identified in the GEIS, and to identify any site-specific differences that could lead to a potential environmental impact.

Section 4.0 of the GEIS provides a description of a generic PWR of a size and rating larger than Rancho Seco. In particular, the reference facility is a 1175-MWe PWR owned by Portland General Electric and designed by Westinghouse Corporation. The Rancho Seco facility is a 913-MWe PWR designed by Babcox and Wilcox Co. Although the designs of the facilities and Nuclear Steam Supply Systems are slightly different, the B&W design includes the same type of major components, buildings, and structures associated with the reference PWR, and consequently involves the same type of decommissioning tasks and considerations. Thus Rancho Seco falls within the envelope of the generic environmental assessment.

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**DECOMMISSIONING ALTERNATIVE**

As discussed in Section 2.1.2 of the DP, the District evaluated the DECON and ENTOMB decommissioning alternatives and found them to be unacceptable for Rancho Seco. These alternatives are addressed further in Section 6.3 of this report.

For the SAFSTOR decommissioning alternative, the GEIS and baseline document, NUREG/CR-0130, analyze cost and person-rem exposure for the length of safe storage in increments of 10, 30, and 100 years. The following analysis is provided for comparison to Rancho Seco:

**COST**

Rancho Seco is proposed to be in safe storage until 2008, approximately 17 years. The GEIS indicates between \$127 and \$131 million (escalated to 1991 dollars) would be required for SAFSTOR decommissioning with a safe-storage period of between 10 and 30 years. For Rancho Seco, TLG Engineering Inc. has developed a cost study that indicates approximately \$281 million (1991 dollars) would be required for the proposed SAFSTOR plan.

The TLG estimate is not directly comparable with the GEIS because it includes the cost of storing the spent fuel at an Independent Spent Fuel Storage Installation (ISFSI), and associated security, which are excluded from the GEIS estimates. The TLG estimates include not only the costs of storing the fuel in the spent fuel pool, with approximately \$1.6 million/year in associated security expense, but also the cost of constructing and eventually demolishing the ISFSI.

**OCCUPATIONAL AND PUBLIC EXPOSURE**

The GEIS indicates between 333 and 664 person-rem of occupational exposure for a safe-storage period of between 10 and 30 years. For the 17 year safe-storage period proposed for Rancho Seco, TLG has estimated 383 person-rem for occupational exposure. This estimated exposure falls within the envelope suggested in the GEIS and is therefore consistent with the generic statement.

As estimated in the GEIS, public exposure for the same safe-storage periods range from 3 to 7 person-rem, primarily from the shipment of radioactive wastes. TLG has estimated approximately 7,300 cubic yards of radioactive waste will be shipped from Rancho Seco as compared to an estimated 23,790 cubic yards for the reference plant. If Rancho Seco ships less than one half the radioactive

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waste of the reference plant, the public exposure would be reduced accordingly. Therefore, the public exposure for Rancho Seco will fall within the envelope of the GEIS.

ENVIRONMENTAL CONSEQUENCES

The attributes of the GEIS have been reviewed and no abnormal consequences have been identified for Rancho Seco. The major environmental consequence associated with decommissioning, commitment of land area to the disposal of radioactive waste, would not result in a serious impact. The estimate of radioactive waste for Rancho Seco as compared to the reference plant is less than one half (23,790 cubic yards for reference plant and 7,300 cubic yards for Rancho Seco), therefore, reducing the impact on land use. Other environmental consequences (e.g., water use, worker levels, accidents, transportation networks) are minor, and are enveloped by the analysis of the GEIS, and would be less for Rancho Seco.

SUMMARY

The analysis of decommissioning planning for RSNGS as compared to the reference GEIS plant is provided throughout this document. Table 1-1 summarizes the results of that comparison. All decommissioning attributes identified for Rancho Seco fall within the envelope of the GEIS, with the exception of the decommissioning cost estimate which is not directly comparable.

SUPPLEMENT TO RANCHO SECO ENVIRONMENTAL REPORT --  
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TABLE 1-1

SUMMARY OF THE ENVIRONMENTAL ATTRIBUTES OF  
DECOMMISSIONING FOR THE GEIS PLANT AND RSNRS

	<u>Reference Plant</u>		<u>Rancho Seco</u>
	10 yr.	30 yr.	17 yr.
Radwaste (yd <sup>3</sup> )	23,790	23,790	7,391
Occupational Exposure (person-rem)	664	333	383*
Public Exposure (person-rem)	7	3	<3**

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\* TLG Engineering, Inc. estimate.

\*\* Based on the reduced level of radioactive waste volume.

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CHAPTER 2

HISTORY AND CURRENT STATUS OF FACILITY

2.1 NUCLEAR OPERATING HISTORY

In its 1964 Annual Report, the District announced plans to build a nuclear power plant. The major events in RSNGS history from its beginning to the present are listed in Table 1-1 of the DP and are described briefly below.

The District received a construction permit for RSNGS on October 11, 1968, and the plant was targeted for commercial operation in the spring of 1973. Actual site preparation and construction began in March 1969.

The Atomic Energy Commission (AEC) issued RSNGS operating license DPR-54 to the District in August 1974. On August 23, 1974, the District completed fuel loading. RSNGS achieved initial criticality in September 1974, and began commercial operation in April 1975.

During 1975 and 1976, RSNGS experienced two lengthy outages as a result of steam turbine failure and main generator seal oil contamination. RSNGS did not achieve full power operation until March 1976.

Because of problems encountered at other similar B&W units, RSNGS shutdown in April 1976, to verify the integrity of surveillance specimen holder tubes within the reactor vessel. During the shutdown, an inspection revealed that the main generator stator was severely damaged, requiring replacement of 84 stator coils. The plant regained full-power production in October 1976.

In 1978, a site transformer failure limited power output to 70-percent capacity for 7 months.

Starting in 1980, failures of turbine rotors, minor steam generator tube leaks, modifications to the auxiliary feed water system, and various NRC-directed inspections and modifications significantly reduced the annual capacity factor.

In December 1985, after an unusual event concerning a complete loss of the Integrated Control System and a subsequent overcooling during shutdown, the District agreed to keep the plant shutdown. The plant was off-line for over 2 years, while the District conducted a comprehensive System Review and Test Program.

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Concurrently, the District performed modifications to the plant including the addition of an Emergency Feedwater Initiation & Control (EFIC) system and an additional set of emergency diesel generators. The plant was restarted in March 1988.

The District's ratepayers voted in a public referendum on June 6, 1989, to discontinue operation of RSNGS by the District, and the plant was shutdown the next day. In August 1989, the District notified the Commission of its intent to shutdown RSNGS permanently and to initiate plans for decommissioning. By December 1989, the facility was being laid-up, and the fuel had been removed from the reactor vessel and placed in the SFP.

Section 2.4 of this report discusses the current status of the plant.

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## 2.2 RADIONUCLIDE INVENTORY

The largest fraction of the onsite radionuclide inventory is contained in the spent fuel, with the reactor vessel and internals containing the next largest fraction. Radionuclides are also present in corrosion films within various plant systems. These radionuclide sources are not readily dispersible in their present condition and will continue to decay during the SAFSTOR period. Table 2-1 provides a summary of the radionuclide inventory at Rancho Seco.

**Spent Fuel Pool.** RSNRS currently has 493 spent fuel assemblies in the SFP, including those from the defueling completed in December 1989. Their burnup ranges from 8,214 to 38,073 megawatt-days per metric ton of uranium, with an average burnup of 26,060. Each of the assemblies originally contained 0.46363 metric tons of uranium. The total inventory is 140,800,000 Curies (Ci), with Ce-144, Pr-144, Cs-137, Ba-137m, Sr-90, Y-90, Pm-174, and Pu-241 accounting for nearly 70 percent of the activity. In 20 years, the inventory will have decayed to 39,630,000 Ci, with Cs-137, Ba-137m, Sr-90, Y-90, and Pu-241 accounting for over 97 percent of the activity.

The radionuclide inventory for non-fuel assembly items stored in the SFP includes 181 orifice rod assemblies, burnable poison rod assemblies, in-core instruments, and retainer assemblies. The total inventory is 94,700 Ci, with Co-60, Fe-55, and Ni-63 accounting for over 99 percent of the activity. In 20 years, the inventory will have decayed to 8,298 Ci, with Ni-63 and Co-60 accounting for over 99 percent of the activity.

The radionuclide deposits on the SFP walls, racks, and related equipment total 47 Ci, with Ni-63, Fe-55, and Co-60 accounting for over 76 percent of the activity. In 20 years, the inventory will have decayed to 15 Curies, with Ni-63 accounting for over 81 percent of the activity.

**Reactor Vessel, Internals, and Primary Shield Wall.** TLG Engineering, Inc., performed an analysis of the activation of reactor vessel, internals, and concrete primary shield. The total amount of Curies resulting from neutron activation estimated to be present in the reactor vessel, internals, and insulation, as of July 1, 1991, is approximately 2.582 million Curies, with Fe-55 and Co-60 accounting for over 86 percent of the activity. Details of the analyses are discussed in Section 3.1.5 of the DP and Appendix A to the DP.

The primary shield wall, including reinforcing steel and the corrugated steel liner, contains approximately 524 Curies. Most

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of the Curies estimated to be present are from radionuclides which are approaching their equilibrium value. Also, the total number of Curies in this analysis is less than those present in the NRC generic PWR estimate.

**Plant Systems.** Internal contamination of plant systems have been characterized by samples taken by Pacific Northwest Laboratory (PNL, 1984), by recent characterization efforts, and by radiological monitoring surveys. The total inventory is 4,490 Ci, with Fe-55, Co-58, Ni-63, and Co-60 accounting for over 88 percent of the activity. This inventory will continue to be evaluated and updated with the ongoing radiological characterization program.

**Surface Contamination.** An estimate of the radionuclide inventory based on swipe analyses for removable contamination has not been attempted. Such an estimate would be unreliable due to the extreme variability of the concentrations and distributions. The radionuclide mixture in the removable contamination is believed to be the same as the mixture used for scaling the activities of dry active waste. Removable contamination extent and levels throughout the plant are presented in Section 3.1.2 of the DP.

**Concrete Core-Bores.** Concrete core-bores analyzed in 1983, indicated that the majority of the contamination resides in the top centimeter of concrete. The exception to this is where cracks have occurred and the contaminants have migrated into the concrete.

**Environmental Radioactivity.** The District has identified onsite environmental contamination in the retention basins, Tank Farm, storm drains, and RHUTs. A comparison was conducted in order to provide a relative perspective between the radioactive constituents found to be present in the identified onsite areas and background environmental radioactivity. The residential soil usage model pathway analysis methodology presented in the draft report NUREG/CR-5512 published January 1990 titled, Residual Radioactive Contamination From Decommissioning, was applied to provide commonality between the various radionuclide constituent mixes and concentrations present at the onsite locations and in the environment. The maximum sample location aggregate radioactivity from each of the identified areas and the average radionuclide background radioactivity concentrations within California, as reported by Oak Ridge National Laboratory in NUREG/CR-4286 were used in the comparison. Application of the residential soil usage methodology results in the radionuclide data being reduced to an equivalent annual dose rate in mrem/yr. Results of this comparison are provided in the following:

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<u>Location:</u>	<u>Annual Dose Rate (mrem)</u>
Retention Basin	9.2
Tank Farm	7.8
Downstream Creek Sediment ( $<0.5$ km)	33.7
CA Environment	24.7

As the above data comparison indicates, the radioactive contamination currently identified is comparable and typically lower than the natural background radioactive contamination present within the soils of the California environs. It should be noted that the estimated total average annual effective dose equivalent to a member of the population of the United States due to all sources of natural background radiation is typically reported as being approximately 300 mrem/yr. Comparison between the dose commitment from natural background radiation is approximately 10 times greater than that attributed to the residential soil usage model methodology data calculated from the onsite environmental contamination. Specifics associated with the radioanalytic data particular to the environmental radioactive contamination onsite areas are detailed below.

**Retention Basins.** Soil samples from around the two retention basins, at the west side of the site, showed levels of contamination ranging from background up to 3.9 pCi/g of Co-60, 1.54 pCi/g of Cs-134, 4.9 pCi/g of Cs-137, and 0.02 pCi/g of Mn-54. The District decontaminated the area and reduced the soil activity to 0.8 pCi/g of Co-60, 0.1 pCi/g of Cs-134, 1.4 pCi/g of Cs-137, and Mn-54 to below minimum detectable levels.

The volume of contaminated sludge and concrete are estimated to be 15 cubic feet and 236 cubic feet, respectively.

**Tank Farm.** The highest detected soil contamination in the Tank Farm was in the vicinity of the Borated Water Storage Tank (BWST), below the valves, near the BWST warming pump. The soil activity was 230 pCi/g of Cs-137, 21 pCi/g of Cs-134, and 79 pCi/g of Co-60 at the west side of the BWST at a depth of 0 to 36 inches. The soil activity was reduced to 2.1 pCi/gm of Cs-137, 0.1 pCi/gm of Cs-134, and 0.6 pCi/gm of Co-60.

**Regenerant Hold Up Tanks (RHUT).** The RHUT's are located west of the Turbine Building. Fixed contamination has been found in the asphalt on the south side of RHUT "A". The levels ranged from 100-400 cpm above background, using an Eberline RM-14 with a HP-210 pancake probe.

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**Storm Drains.** Soil in some of the storm drains onsite shows detectable radioactivity. The levels detected would not require remedial action using current regulatory guidance and the proposed residual radioactivity levels. The highest levels detected were 0.9 pCi/gm of Cs-137, 0.2 pCi/gm of Co-60, and 0.1 pCi/gm of Cs-134.

**Cooling Towers.** Plant staff sampled each cooling tower in May 1990, to determine if the sludge at the bottom of the tower basins was contaminated. The results showed that the activity was less than the environmental levels of 0.3 pCi/g of Cs-137 and 0.04 pCi/g of Cs-134.

**Offsite.** Routine periodic soil samples have been obtained for radioanalysis as part of the RSNRS environmental monitoring program. Waste water generated by RSNRS operations is collected in the RHUTs and held for analysis, both chemical and radioanalytical, to determine if treatment is necessary prior to being released to onsite retention basins. Occasionally the waste water released from the RHUTs contain small amounts of radioactivity in the form of tritium, fission products, or activated particles.

Once in the retention basins, the waste water is again analyzed to determine necessary dilution requirements prior to release to the Clay Creek effluent stream. The concentration of radioactive material in liquid effluents released beyond the site boundary shall not exceed the limits of 10 CFR 20, Appendix B, Table II, Column 2.

As a result of the released waste water occasionally having a radionuclide inventory, levels of radioactivity above background have been detected along Clay Creek. The most recent detailed analysis of Clay Creek sediment, conducted by Lawrence Livermore National Labs during 1989, shows the maximum radionuclide concentration contained in the creek sediment within 0.5 kilometers of Rancho Seco's release point to be 1.47 pCi/gm of Co-60, 1.20 pCi/gm of Cs-134, and 11.00 pCi/gm of Cs-137. The average radionuclide concentration in this same area was found to be 0.43 pCi/gm of Co-60, 0.38 pCi/gm of Cs-134, and 3.72 pCi/gm of Cs-137. Additional radiological information is presented in NUREG/CR-4286, "Evaluation of Radioactive Liquid Effluent Releases from the Rancho Seco Nuclear Power Plant, and the Rancho Seco Annual Radiological Environmental Monitoring Report."

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## 2.3 RADIATION SURVEY RESULTS

### 2.3.1 Radiological Status of Systems and Structures

**Accessible Structures/Systems.** The principal structures containing significant levels of contamination are the Reactor Building, Fuel Storage Building, and the radiologically controlled areas of the Auxiliary Building. Tables 2-1 and 2-2 of the DP identify areas where contamination is known or suspected to be present.

Numerous systems and components at RSNCS contain radioactive contamination in the form of contaminated fluids, sludges, and corrosion films on surfaces. Systems and components with known or suspected contamination are identified in Table 3-4 of the DP.

**Areas Outside of Structures.** Areas outside of the plant buildings in which radioactive contamination is known or suspected to exist include the following:

- o Tank Farm Area - asphalt (south side), concrete and soil contamination ranging from background to 2.8 pCi/g of Cs-137, Cs-134, Co-60, and Sb-125.
- o "A" RHUT - fixed contamination on the asphalt north and south of the RHUT.
- o Retention Basins - soil and/or concrete surrounding basins contain low levels of Cs-134, Cs-137, and Co-60.

**Inaccessible Structures/Systems.** Several of the plant areas are generally inaccessible due to high radiation levels and/or structural barriers. The status of these normally inaccessible high radiation areas and radwaste sumps is summarized in Section 3.1.1 of the DP.

### 2.3.2 Radiological Status of Contaminated Buildings

In April 1990, the District implemented a radiological characterization program to supplement existing RSNCS radiological data. Figures 3-1 through 3-13 of the DP show plant layouts with dose rates and contamination levels for the various structures onsite. Tables 3-5 through 3-8 of the DP list the contamination and radiation levels for the Auxiliary and Reactor Buildings.

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TABLE 2-1  
RADIONUCLIDE MATERIAL  
INVENTORY (CURIES) AT RANCHO SECO

LOCATION	DATE			
	(7/1/90)	(7/1/00)	(7/1/10)	(7/1/20)
Fuel Assemblies	1.408E+08	5.210E+07	3.963E+07	3.091E+07
Non-fuel Assemblies	9.470E+04	2.346E+04	8.298E+03	4.389E+03
SFP CRUD	4.715E+01	1.855E+01	1.478E+01	1.315E+01
Reactor Internals	2.56E+06*	5.737E+05	2.228E+05	1.421E+05
Primary Shield Wall	5.17E+02*	9.538E+01	3.333E+01	1.765E+01
Corrosion Films	4.490E+03**			
Sludge in Basins	3.429E-03	1.662E-04	2.864E-05	1.526E-06

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\* As of June 1, 1991.

\*\* As of June 1983.

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CHAPTER 3

PROPOSED ACTION

3.1 INTRODUCTION

System components and status are described in Table 2-1 of the DP and the schedule is shown in Figure 2-1 of the DP. Staffing and radiation exposure level estimates for these activities and tasks are summarized in DP Table 2-2.

The District has developed detailed plans for Custodial and Hardened-SAFSTOR, since these phases will be implemented at the beginning of SAFSTOR, using available decommissioning technologies. Planning for Deferred-DECON is more general, with detailed planning to be developed towards the end of Hardened-SAFSTOR.

The District intends to store spent fuel in the Spent Fuel Pool (SFP) during the initial phase of decommissioning (Custodial-SAFSTOR) and later move the spent fuel to dry storage at an onsite ISFSI prior to the Hardened-SAFSTOR phase of decommissioning. Deferred-DECON (decontamination and dismantlement) will commence after 2008.

The present status and proposed future condition for systems and structures during Custodial and Hardened-SAFSTOR are shown in DP Table 2-1.

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**3.2 SAFSTOR ACTIVITIES AND TASKS**

This section discusses the activities and tasks associated with Custodial and Hardened-SAFSTOR and Deferred-DECON of the plant systems and structures identified in Section 2.2.4 of the DP. Plant systems and structures are categorized into the following eight groups:

- o Plant Building Structures
- o Nuclear Steam Supply Systems
- o Turbine Plant Systems
- o Plant Water Systems
- o Miscellaneous Mechanical Systems
- o Radioactive Waste Systems
- o Instrumentation and Control Systems
- o Electrical Systems.

The plant layout and equipment locations are shown in Figures 2-10 through 2-13 of the DP. Section 2.2.4 of the DP provides a detailed description and status of plant systems and structures during layup, Custodial-SAFSTOR, and Hardened-SAFSTOR.

The activities required for preparation for Custodial and Hardened-SAFSTOR include:

- o Planning and preparation
- o Disposition of nonessential structures and systems
- o Site and facilities radiological characterization
- o Maintenance of safe-stored structures and systems
- o Decontamination of selected structures and systems
- o Liquid radwaste processing
- o Solid radwaste handling, packaging, and shipment
- o Spent fuel storage

The present status and scope of work for Custodial-SAFSTOR activities is summarized below.

**Planning and preparation.** Shortly after June 7, 1989, the District began putting the plant in protective lay-up, and by December 8, 1989, all fuel was removed from the reactor vessel. Efforts to place systems into protective lay-up should be completed in 1991.

Other activities planned to place RSNRS in Custodial and Hardened-SAFSTOR include:

- o Immobilizing accessible contamination and removing non-contaminated liquids. This includes draining and

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isolating systems to be abandoned or preserved per Table 2-1 of the DP.

- o Removing and storing/disposing of radioactive and nonradioactive wastes associated with system draining, isolation, abandonment, and or preservation.
- o Isolating areas by placing barriers/locks to prevent entry into highly radioactive spaces.
- o Operating and maintaining monitoring systems such as radiation, intrusion, fire detection, and electrical power distribution during and following preparation for SAFSTOR.
- o Constructing an ISFSI during the Custodial-SAFSTOR phase.

**Disposition of nonessential structures and systems**

This activity comprises a major portion of Custodial-SAFSTOR planning. Shutdown of RSNRS eliminated the need for a majority of plant systems and structures. The majority of this equipment will be abandoned in place, allowed to safely deteriorate unmonitored and unmaintained, or sold. However, some effort is required (e.g., liquid and oil drainage, system isolation, electrical de-energize, etc.) to abandon these systems safely.

Buildings not specifically listed in the DP are considered to be radiologically uncontaminated such that unrestricted access is possible for maintenance and routine inspections by authorized individuals in accordance with the requirements of 10 CFR 20.105. Accordingly, these structures can be released for asset recovery or demolished and the areas released for unrestricted use.

**Site and facilities radiological characterization**

In May 1990, the District completed a preliminary radiological characterization survey at RSNRS. A summary of the radiological status of the site and facilities is included in Section 3.1 of the DP. Other surveys will be ongoing and will be performed at the completion of the Custodial and Hardened-SAFSTOR phases to assist in planning and for radiological control.

**Maintenance of safe stored structures and systems**

As detailed in the DP, the District will maintain those structures and systems necessary to protect plant personnel and public health and safety, and to conduct decommissioning activities. As listed

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in Table 2-1 of the DP, systems and structures that are no longer necessary will not be maintained. In the abandoned condition, degradation of the equipment will be allowed to progress naturally. Maintenance on such systems will be suspended.

**Decontamination/Isolation of selected structures and systems**

Where practicable, the District will decontaminate floors, walls, and other building surfaces with simple decontamination techniques. Areas will be cleaned by vacuuming, mopping, or scrubbing with cleaning agents compatible with the waste treatment system. Mechanical decontamination of external surfaces will be performed only on surfaces that contribute significantly to the radiation exposure of surveillance and maintenance personnel during Custodial and Hardened-SAFSTOR. Likely areas include hallways and corridors.

In areas containing "hot spots," the District will perform external decontamination and/or provide shielding to reduce background levels of occupied spaces. Radiation Protection will evaluate the radiation dose rates, accessibility, and anticipated exposure incurred during decontamination prior to implementing any remedial decontamination. These decisions will be made based on ALARA principles. Areas with high radiation and/or contamination levels that are accessed infrequently, will be isolated by locked doors or other appropriate barriers.

To keep occupational doses ALARA, chemical decontamination of system internals is not planned during Custodial or Hardened-SAFSTOR. Decontaminating the primary system with chemicals may be performed during Deferred-DECON if it meets the principles of ALARA.

**Liquid radwaste processing**

The plant liquid waste storage system or tanks designated for temporary storage will collect liquid radioactive wastes generated during decommissioning operations. The wastes will be processed into a form acceptable for disposal. Systems designed to control the release of hazardous material to the environment or to non-contaminated portions of the facility will be in operation during decommissioning and waste processing activities.

Section 3.3 of the DP describes the liquid radwaste management approach to be taken during SAFSTOR.

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**Solid radwaste handling, packaging, and shipment**

The solid radwastes generated from surveillance and maintenance activities during Custodial-SAFSTOR, may be reduced in volume before disposal. Section 3.3 of the DP discusses the quantities of solid waste expected to be generated.

**Spent fuel storage**

During Custodial and Hardened-SAFSTOR, spent fuel will be stored onsite at either the SFP or the ISFSI. Section 3.3.1 of the DP presents detailed information regarding spent fuel storage and disposal.

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**3.3 STAFFING AND EXPOSURE SUMMARIES**

Table 2-2 of the DP lists the staffing (person-hours) and radiation exposure (person-rem) estimates to perform tasks in radiologically controlled areas for Custodial and Hardened-SAFSTOR. Exposure estimates are based on these staffing estimates and the radiation levels in the work areas. The total staffing is estimated to be 232,000 person-hours and the estimated total exposure is 135 person-rem.

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3.4 DEFERRED-DECON

Prior to commencing Deferred-DECON, the District will file a revised DP describing the process for removing all radioactive components and detectable radioactivity from the RSNGS site. This request for dismantling the reactor and terminating the facility's license will include a detailed plan describing the organization and program to be in place during Deferred-DECON. The plan will accomplish the required tasks using ALARA concepts and will clearly describe how the District will continue to protect the health and safety of the public and the environment during the dismantling activities. The District will also submit a revised environmental report along with the revised DP.

Preparation for Deferred-DECON

In preparation for actual decontamination and dismantlement, the District will initiate the following activities:

- o Prepare site support and storage facilities as required
- o Conduct radiation surveys of work area contamination and general dose rates; major component, piping, and structure dose rates; internal piping contamination levels; and activation profiles from primary shield core samples
- o Verify earlier estimates of residual byproduct material inventory for plant components, structures and systems, and normalize neutron flux profiles from earlier estimates to survey data for development of packaging and shipping requirements and decommissioning safety requirements
- o Determine shipping container requirements for activated materials, including cask liners.
- o Develop procedures for occupational exposure control, control and release of liquid and gaseous effluents, control of solid radwaste, site security and emergency programs, and industrial safety.

Deferred-DECON Operations

Following NRC approval of the revised DP, the NRC will issue an order authorizing implementation, and the District will begin the decontamination and dismantlement process. Deferred-DECON may involve the following:

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- o Construct temporary facilities and arrange existing storage facilities to support dismantling activities.
- o Design, procure, and install a water cleanup system for removing cutting residues and crud deposits from the reactor vessel.
- o Design and fabricate special shielding and contamination control tents, special tooling, and remotely operated equipment.
- o Modify the refueling canal to support segmentation activities and prepare rigging for segmentation and removal of piping sections and components, including the reactor vessel and its internals.
- o Procure required shipping casks, liners, and Low Specific Activity (LSA) containers from suppliers.
- o Conduct decontamination of components and piping systems as required.
- o Remove, package, and dispose of piping and components as they are no longer required to support the decommissioning process.
- o Remove control rod drive housings and instrumentation tubes from reactor vessel head and cut into sections for disposal.
- o Reassemble vessel head and flange (following flange separation from vessel), and weld a closure plate on the lower end of this assembly for shipment and burial as its own container.
- o Segment upper and lower core support structures and in-core instrumentation and package in shielded casks. These operations may be performed remotely by cutting equipment within a contamination control tent.
- o The vessel water level will be lowered sequentially with each reactor vessel cut to just below the elevation of the cut. When the water level is below the reactor vessel inlet and outlet nozzles, remove the reactor coolant piping and pumps. Package the piping in standard LSA containers. The reactor coolant pumps will be sealed

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with steel closure plates so the pumps may serve as their own shipping containers.

- o Segment and section the reactor vessel and package into shielded containers.
- o Remove systems and associated components as they become nonessential to the support of vessel disposition, other decommissioning operations, or worker health.
- o Remove the concrete biological shield and all accessible contaminated concrete (excluding steam generator and pressurizer cubicles).
- o Remove the steam generators and pressurizer for shipment and burial. Decontaminate exterior surfaces, as required, and seal-weld closure plates in all openings in the steam generators and pressurizer.
- o Perform a radiation survey to assure that remaining portions of the containment structure are free of surface contamination and that containment integrity is no longer required.
- o Remove contaminated equipment and material from the Auxiliary Building and any other contaminated areas in the Fuel Storage Building once the SFP has been emptied of racks, miscellaneous tools, and stored materials. Use radiation and contamination control techniques until radiation surveys indicate that the structures can be released for unrestricted access and conventional demolition.
- o Ship and bury packaged items, piping, pumps, and all remaining radioactive materials.
- o Conduct a final radiation survey to assure that all detectable radioactive materials have been removed. Submit the final survey data in a decommissioning report to the NRC.

License Termination

Following notification by the District of completion of the decontamination and disposal of components and materials from the facility, the NRC regional staff will verify that the acceptable activity and contamination levels are satisfied. When the

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requirements are satisfied, the NRC can terminate the license and any further NRC jurisdiction over the facility.

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**3.6 SITE RESTORATION**

Site restoration is not part of radiological decommissioning subject to NRC approval, and hence is beyond the scope of this report. However, as a matter of information, the District contemplates the following types of restoration activities. Buildings no longer required may be demolished, and building foundations backfilled. Site areas affected by dismantling activities may be cleaned-up and the station area graded and landscaped, as required. These activities may include:

- o Demolishing remaining portions of the internal containment structure and interior portions of the Reactor Building.
- o Removing the steel containment liner and demolishing the concrete Reactor Building.
- o Removing the Fuel Storage and Auxiliary Buildings using conventional demolition techniques for above ground structures.
- o Demolishing the remaining buildings and structures including the Turbine Building, Radwaste facilities, and cooling towers.
- o Removing outside storage tanks.
- o Preparing the final dismantling program report.

Certain remaining buildings or structures may be used for other functions, at the discretion of the District.

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**SITE AND ENVIRONMENT**

**4.1 SITE LOCATION AND DESCRIPTION**

**4.1.1 Location**

The Rancho Seco site is in the southeast part of Sacramento County, California. It lies either wholly or partly in Sections 27, 28, 29, 32, 33, and 34 of Township 6 North, Range 8E. The site is approximately 26 miles north-northeast of Stockton and 25 miles southeast of Sacramento, as shown in Figure 4-1. The Rancho Seco nuclear reactor unit and ISFSI lie wholly in Section 29, as shown in Figure 4-2.

More generally, the site is located between the Sierra Nevadas to the east and the Coast Range along the Pacific Ocean to the west in an area of flat to lightly rolling terrain at an elevation of approximately 200 feet mean sea level (msl). To the east of the site the land becomes more rolling, rising to an elevation of 600 feet at a distance of about seven miles, and increasing in elevation thereafter approaching the Sierra Nevada foothills.

**4.1.2 Description**

The site is approximately 2480 acres with all acreage being owned by the District. The nearest population of 25,000 or more is Lodi, about 17 miles southwest of the site. The site area is almost exclusively agricultural and is presently used as grazing land. The climatology of the Rancho Seco site is typical of the Great Central Valley of California. Cloudless skies prevail during summer and much of the spring and fall seasons due to the Pacific anticyclone off the California coast which prevents Pacific storms from entering inland. The rainy season usually extends from December through March. Atmospheric dispersion factors for the site are considered favorable.

Groundwater in the site area occurs under free or semi-confined conditions. It is stored chiefly in the alluvium, the older alluvial type deposits, and the Mehrten Formation. Groundwater movement in the area is to the southwest with a slope of about ten feet/mile.

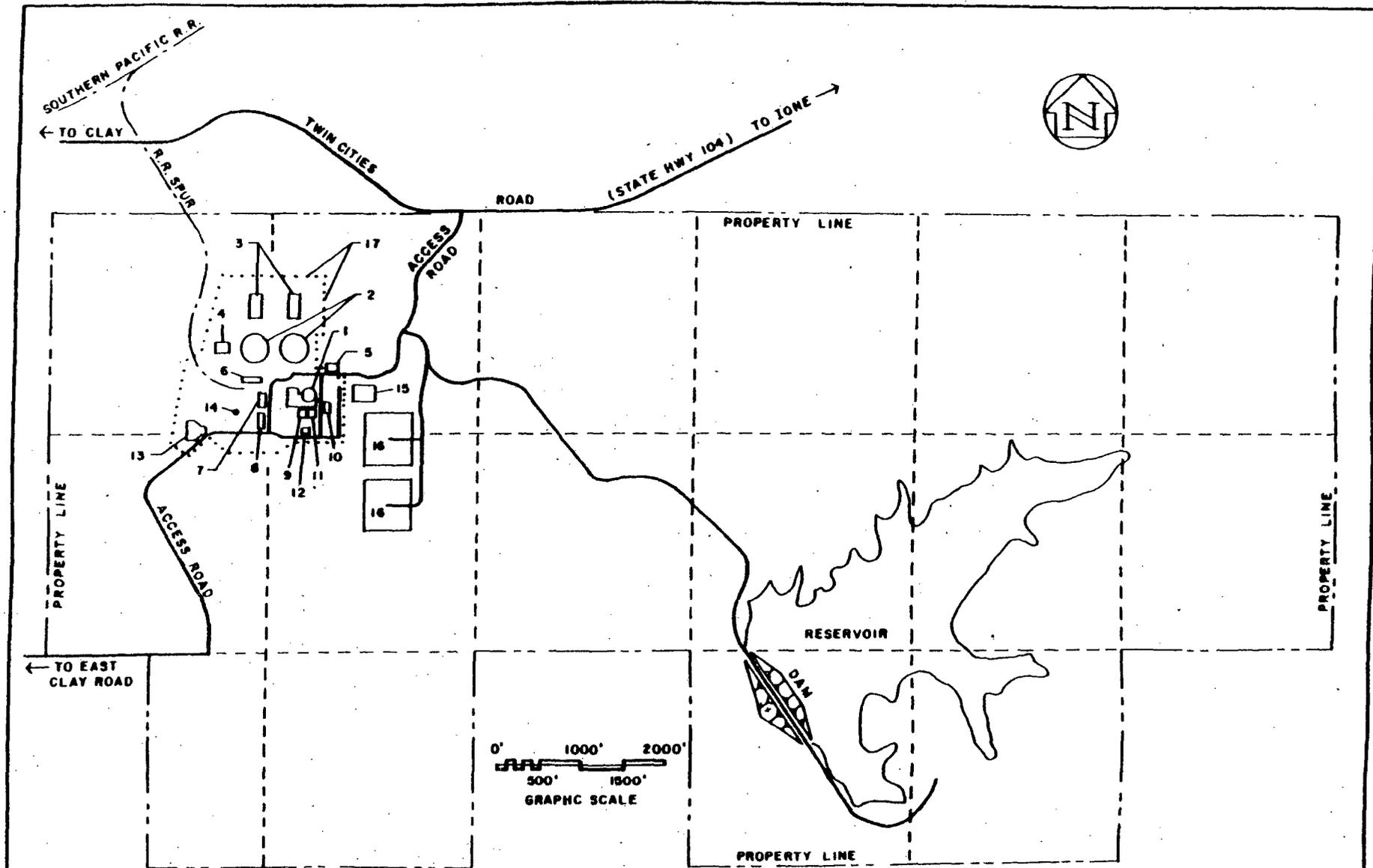
There is no indication of faulting beneath the site. The nearest fault system, the Foothill Fault System, is about ten miles east of the site and has been inactive since the Jurassic Period, some

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135 million years ago. Ground accelerations of no greater than 0.05g are anticipated at the site during the life of the plant.

The soils at the Rancho Seco site can be categorized as hard to very hard silts and silty clays with dense to very dense sands and gravels.





- LEGEND**
- |                  |   |                            |                      |
|------------------|---|----------------------------|----------------------|
| 1. REACTOR BLDG  | 6. CONSTRUCTION WAREHOUSE                   | 10. ADMINISTRATION BLDG    | 15. TECHNICAL CENTER |
| 2. COOLING TOWER | 7. WAREHOUSE                                | 11. T & R BLDG             | 16. P.V. UNITS       |
| 3. SPRAY POND    | 8. CONSTRUCTION OFFICE/<br>BECHTEL BUILDING | 12. DIESEL GENERATION BLDG | 17. PERMETER FENCE   |
| 4. I.O.S. BLDG   | 9. N.S.E. BLDG                              | 13. RETENTION BASIN        |                      |
| 5. P.A.P. BLDG   |   | 14. SWITCHYARD             |                      |

**RANCHO SECO  
SITE LOCATION  
FIGURE 4-2**

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**4.2 POPULATION DISTRIBUTION AND TRENDS**

The land surrounding the site is presently undeveloped and is used primarily for grazing beef cattle and other agricultural activities. The Sacramento County Planning and Community Development Department has compiled growth and development projections out to the year 2010.

There is no development projected for the north, east, or south sides of the site. These areas will continue to be used for grazing beef cattle and other agricultural purposes. There may be some subdivision of the land to the west of the site with the subsequent buildup of new residences. One to ten acre plots are projected, hence the buildup will be relatively sparse.

The most recent population distribution estimates are contained in the "Evacuation Time Estimate for the Rancho Seco Plume Exposure Pathway Emergency Planning Zone" prepared by HMM Associates, Inc., in December 1989. The State of California Department of Finance demographic report, dated February 1989, provides the population projections for the 50 mile radius of Rancho Seco out to the year 2020.

**4.2.1 Population Within 10 Miles**

Figure 4-3 shows the 1989, permanent population for 22-1/2 degree sectors, at one-mile increments, surrounding the Rancho Seco site. Permanent residents are defined as those persons having year-round residences within the described area. There are currently 15,550 permanent residence within the 10 to 13-mile radius of the Rancho Seco site. Table 4-1 presents in tabular form the permanent population distribution within 13 miles of the Rancho Seco site.

A five-mile radius area surrounding the Rancho Seco facility is defined as the low population zone. This area is primarily farm land, with few tourist attractions and little seasonal variation in the population.

A survey of the area contiguous to the plant beyond the 0 to 5 mile radius shows that the nearest population concentration of intractable size is approximately 6.5 miles from the plant site.

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4.2.2      Population within a 50-mile Radius of Rancho Seco

The nearest population center of 25,000 or more is Lodi, 17 miles south-southwest of the site. Other population centers of greater than 25,000 people include Sacramento at 25 miles, Stockton at 26 miles, and Modesto at 50 miles.

Table 4-2 shows the projected population within a fifty mile radius of Rancho Seco out to the year 2020.

4.2.3      Special Facilities Population

There are 16 special facilities in Amador and Sacramento Counties within a 10-mile radius of Rancho Seco. They consist of five public schools (one high school and four elementary); one private elementary school; one treatment center for TB and alcoholic patients; four residential care homes; an adult training center for developmentally disabled; a California Department of Forestry Fire Academy; the Preston School of Industry; a nudist ranch; and Mule Creek State Prison.

TABLE 4-1

PERMANENT POPULATION DISTRIBUTION WITHIN 13 MILES

Sector	0-1 Mi.	1-2 Mi.	2-3 Mi.	3-4 Mi.	4-5 Mi.	5-6 Mi.	6-7 Mi.	7-8 Mi.	8-9 Mi.	9-10 Mi.	10-11 Mi.	11-12 Mi.	12-13 Mi.	Total
N	0	0	0	0	0	9	0	0	61	237	61	20	0	388
NNE	0	0	0	0	0	18	0	0	105	233	73	0	0	429
NE	5	0	7	3	0	3	61	125	11	85	22	50	40	412
ENE	9	0	0	0	4	0	0	67	158	153	67	50	50	558
E	0	0	4	0	0	0	9	81	63	1414	1408	0	0	2979
ESE	0	9	0	0	0	0	26	13	136	403	183	40	0	810
SE	0	5	4	0	12	8	0	20	40	47	28	80	0	244
SSE	0	0	0	0	12	0	24	12	49	150	81	0	0	328
S	0	0	0	0	12	20	12	24	359	461	113	0	0	1001
SSW	5	0	14	22	15	24	50	89	270	341	0	0	0	1030
SW	22	22	112	163	76	41	44	163	151	162	0	0	0	956
WSW	0	0	76	54	11	62	148	207	177	127	26	0	0	888
W	0	0	18	14	69	256	271	84	17	41	0	0	0	770
WNW	0	0	7	4	43	161	367	230	498	355	0	0	0	1665
NW	0	0	0	4	36	66	311	524	167	53	0	0	0	1161
NNW	0	0	0	0	4	35	114	1016	604	158	0	0	0	1931
<b>TOTAL</b>	<b>41</b>	<b>36</b>	<b>242</b>	<b>264</b>	<b>294</b>	<b>703</b>	<b>1437</b>	<b>2655</b>	<b>2866</b>	<b>4620</b>	<b>2062</b>	<b>240</b>	<b>90</b>	<b>15550</b>

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TABLE 4-2

PROJECTED POPULATION WITHIN 50-MILE RADIUS OF RANCHO SECO

<u>COUNTY</u>	<u>1970</u>	<u>1985</u>	<u>2000**</u>	<u>2000</u>	<u>2010</u>	<u>2020</u>
ALAMEDA	100	300	400	350	375	395
AMADOR	11807	18200	23600	26000	34500	40000
CALAVERAS	13456	16100	19600	25900	38700	46000
C COSTA	69301	168900	242000	206000	224500	242450
EL DORADO	28567	47100	69800	72120	88200	104000
NEVADA	330	400	500	500	575	630
PLACER	66943	113100	157600	162000	201800	236000
SACRAMENTO	630189	952500	1259500	1161300	1324700	1482200
SAN JOQ	290194	355900	421500	528000	624600	722000
SOLANO	53646	104400	147600	148500	173600	197300
STANISLA	111201	128000	154700	176000	206000	237000
SUTTER	3050	5000	6400	6200	6800	7400
TULOMNE	12509	24100	31900	38600	44800	51200
YOLO	88548	120600	161000	144300	151900	172500
YUBA	1735	2100	2800	2480	2610	2720
<b>Total</b>	<b>1381576</b>	<b>2056700</b>	<b>2698900</b>	<b>2698250</b>	<b>3123660</b>	<b>3541795</b>

\*\* These numbers are from the Updated Safety Analysis Report July 1982.

Source: Department of Finance Demographic report February 1989.

Population Totals

Ring No.	Ring Pop.	Cum. Pop.	Ring No.	Ring Pop.	Ring Pop.
0 - 1	41	41	7 - 8	2655	5672
1 - 2	34	77	8 - 9	2866	8538
2 - 3	242	319	9 - 10	4620	13158
3 - 4	264	583	10 - 11	2062	15220
4 - 5	294	877	11 - 12	240	15460
5 - 6	703	1580	12 - 13	90	15550
6 - 7	1437	3017			

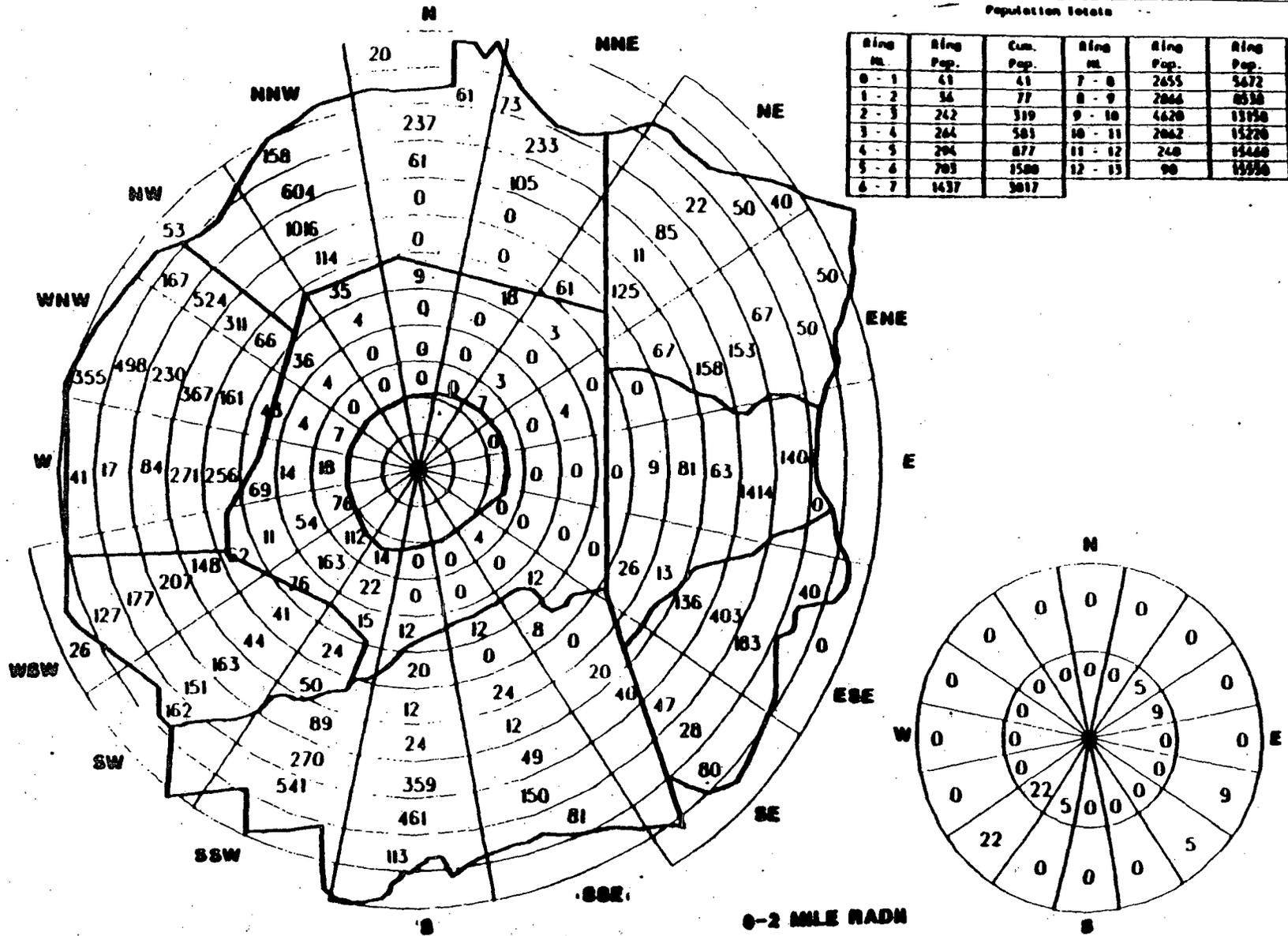


FIGURE 4-3

PERMANENT POPULATION WITHIN A 10 MILE RADIUS OF RANCHO SECO



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4.4 ADJACENT LAND USE

4.4.1 Land Use

The site area is almost exclusively agricultural. USAR Figure 2.2-6 provides a detailed description of all agriculture and residential activities within a 5-mile radius of the site. The agricultural activities in the counties lying within the 50-mile radius are shown in USAR Figures 2.2-7, 2.2-8, and 2.2-9.

There are at present three large-scale commercial dairies in the vicinity, each with over 200 cows. The closest dairy is approximately 8 miles northwest of the site. A ranch 1 mile east of the site has dairy cows for domestic use only.

Activities in the area immediately surrounding the site are not expected to change extensively. Proposed land use for the southeast section of Sacramento County as adopted by the Sacramento Planning Department is predominantly (70 percent) agricultural and is expected to remain agricultural.

4.4.2 Access and Egress

As shown in Figure 4-1, State Route 104 runs just north of the site in a general east-west direction and connects with State Route 99 to the west and State Route 49 to the east. There are no public highways that transverse the exclusion area.

The Twin Cities Access Road, identified in Figure 4-2, is the main access road to the plant and to nearby recreation facilities. This road is not a through road and is designed to handle heavy construction vehicles.

Rail access to the site is available via a rail spur from the existing Southern Pacific Railroad line that runs roughly parallel to State Route 104 adjacent to the site. The routing of the rail spur is shown in Figure 4-2.

4.4.3 Water Supply

The District obtains water for Rancho Seco from the Folsom South Canal. The Bureau of Reclamation constructed the canal as part of the Central Valley Project. A pipeline and pumping station are located between the plant and the Folsom South Canal.

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4.5 METEOROLOGY

4.5.1 General Climate

The climate of the Rancho Seco site is generally that of the Great Central Valley of California. Summers are hot and cloudless and the winters are mild. The rainy season occurs between October and May with more than two-thirds of the annual rainfall occurring in December through March. Heavy fog occurs in mid-winter, primarily in December and January, and may last for several days.

The most important controlling geographical influence on the climate results from the mountains which surround the valley to the west, north, and east. During the winter, storms which pass through the area are moderated by the mountains which collect much of the precipitation. The rains that occur in the valley are usually accompanied by south to southeast winds. The cold north and northwest winds pass over the mountains to the north where the air is warmed dynamically by descent into the valley resulting in comparatively warm, dry winds. A similar condition occurs infrequently in the summer when a steep northerly pressure gradient develops, producing a pronounced heat wave.

The Central Valley warms greatly during the day resulting in a marked thermal contrast between the valley and the air over the Pacific. The Coast Range separates the marine air from the valley air except for a gap through the range formed by the Sacramento-San Joaquin Rivers. The heavy marine air flows through this gap and splits into a northerly flow into the San Joaquin Valley and a southerly flow into the Sacramento Valley.

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**4.6 HYDROLOGY**

**4.6.1 Characteristics of Streams and Lakes in the Vicinity**

USAR Table 2.4-1 provides a summary of reservoirs and lakes in the vicinity of RSNRS. Each reservoir and lake is coded by number in USAR Table 2.4-1 for easy location on the location map, USAR Figure 2.4-1.

**4.6.2 Topography**

The site is gently rolling and is not intersected by any streams, but is bounded by well-defined drainage courses that intercept surface runoff from the higher site topography. Plant grade at approximately 165 feet elevation above sea level permits excellent drainage at all times without danger of flooding. Plant areas are graded to provide natural drainage to lower ground. The rolling terrain of the site affords excellent drainage along natural gullies at gradients varying from 2 to 6 percent. Elevations vary from 130 feet to 280 feet above sea level.

**4.6.3 Terminal Disposal of Storm Runoff**

The site is bounded on the north by Hadselville Creek, which intercepts all drainage from the site and empties into Laguna Creek to the west. Flow is continued westerly by Laguna Creek South, a tributary of the Consumnes River, and into the Mokelumne River. The Mokelumne is a tributary of the southerly flowing Sacramento River and enters the Sacramento River approximately 20 miles south of the city of Sacramento.

Storm water runoff at the Rancho Seco site is controlled primarily by surface ditches. Generally, overland flows will be intercepted by the ditches and diverted around the plant to natural stream channels. When this is not possible, runoff will be diverted down cut slopes in culvert pipes and discharged to the plant drainage ditch system. The drainage system was designed to accommodate the 25-year recurrence storm with a minimum of six inches freeboard and the 100-year recurrence storm with zero freeboard.

**4.6.4 Historical Flooding**

Within recent historical times, no flooding or inundation from storms or runoff has occurred within the site boundaries. It is

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unlikely that the site can be inundated or flooded, even with abnormal rainfall intensities.

**4.6.5 Prediction of Land Urbanization**

A survey conducted by Sacramento County indicates that the land adjoining the site within at least a 15-mile radius will remain primarily for agricultural and grazing use; therefore, the rainfall runoff factors will remain constant and not cause any difference in hydrological properties.

**4.6.6 Groundwater**

Pumping tests conducted in exploratory holes indicated the presence of groundwater underlying the site approximately 150 feet below the original ground surface. The water is of good quality and is readily extracted by wells.

Groundwater in this area occurs under free or semi-confined conditions as a part of the Sacramento Valley Groundwater Basin. The storage capacity of the basin is very large, but in the vicinity of the site, water levels are steadily dropping, as shown by the hydrograph of USAR Figure 2.4-13. The water is stored chiefly in the Mehrten Formation. The sand and gravel zones of that formation yield water readily to wells.

Galt and Lodi are the closest communities with public groundwater supplies to the south and west. Their spatial relationship to the project site is shown on USAR Figure 2.4-14. They are supplied by the City of Galt Water System, the Lodi Municipal Water Works, and the North San Joaquin Water Conservation District (Lodi area). The City of Galt Irrigation District buys Rancho Seco discharge water for irrigation.

The wells supplying Galt and Lodi penetrate a number of aquifers. The Lodi wells draw water from recent alluvium, the Victor Formation, the Laguna Formation, and probably the Mehrten Formation. The Galt wells tap the Laguna Formation and probably the Mehrten Formation. The approximate time required for groundwater moving through the Mehrten Formation aquifer from the Rancho Seco site to the Galt area can be calculated from available data, and is discussed in USAR Section 2.4.6.1.

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4.7 GEOLOGY AND SEISMOLOGY

4.7.1 Geology

The Rancho Seco site is about 25 miles southeast of Sacramento in the low hills at the edge of the Sierra Nevada Mountains. The site is founded on the Pliocene Laguna Formation and is underlain by an estimated 1,500 to 2,000 feet of Tertiary or older sediments deposited on a basement complex of granitic to metamorphic rocks.

Explorations at the site included field mapping, 1,552 feet of bucket auger holes logged in detail, a 602-foot core hole visually and geophysically logged, 2,016 feet of small-hole borings that were logged and from which soil samples were taken for laboratory testing, and approximately 11,500 feet of geophysical refraction profiles. The data obtained indicated the unfaulted nature of the sediments and their suitability as a foundation upon which the RSNGS was constructed.

A detailed account of the conditions at the site can be found in USAR, Appendix 2C (Geology and Seismology)

4.7.2 Seismology

There is no indication of faulting beneath the site. The nearest fault system, the Foothill Fault System, is about 10 miles to the east of the site; it has been inactive since the Jurassic Period, some 135 million years ago. The nearest active faulting along which historic large earthquake shocks have originated are the Hayward and San Andreas Faults, some 70 and 89 miles to the west, respectively, and the faults over 80 miles to the east beyond the Sierra Nevada Range.

There is no reason to anticipate fault propagation in the site area. Earthquake shaking will occur as the result of shocks along distant faults, but because of their distant origin and the nature of the foundation material beneath the site, ground accelerations greater than 0.05g should not occur during the life of the ISFSI. Conservative values of 0.25g horizontal and 0.17g vertical were used for the Design Basis Earthquake (DBE) for RSNGS.

Further discussion of the site seismicity may be found in the Seismic Report in USAR Appendix 2D and supplements. Earthquake design criteria for the site can be found in USAR Appendix 5B.

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4.8 BIOTA

4.8.1 Ecology of the Site

The site is located at the eastern edge of the Central Valley grassland in the vegetation type known as the California prairie or the California annual grasslands. These grasslands are part of the complex of plant communities that evolve in seasonally hot and dry climates dominated by maritime influences.

Such community complexes were first described for the eastern Mediterranean basin and are consequently called Mediterranean-type ecosystems. The Rancho Seco grassland is a fairly typical Mediterranean-type annual grassland, both with respect to important physical parameters and the limited evidence on ecosystem structure and function.

The gently rolling topography characteristic of the site stretches along the low foothills to the northwest and southeast. To the west, the grassland continues onto the flat alluvial plain of the Central Valley floor less than four miles away. Since the site is so severely water-limited, nearby areas having abundant water may be particularly important sources of immigrant species which are either accidental or temporarily resident in the Rancho Seco region. Example of such areas include the Sacramento - San Joaquin Delta, 20 miles to the northwest, and the Folsom and Camanche Reservoirs, 27 miles to the north and 10 miles to the southeast, respectively.

The Rancho Seco grassland ecosystem appears to be the same as other sections of grazed annual grassland along the east side of the Central Valley, except for the large areas of vernal pools found about 1-1/2 to 2 miles to the south and east of the powerplant.

4.8.2 Vegetation Patterns at Rancho Seco

Like other annual grasslands, Rancho Seco is highly seasonal and limited by annual precipitation. Its productivity is a function of variation in rainfall, which in turn affects soil moisture and ultimately the length of the growing season. In addition, the combined stress of high temperatures, strong solar insolation, low atmospheric humidity, and low soil moisture force the grassland into dormancy during the summer season (approximately May to October).

The Rancho Seco grassland has the additional stress of cattle-grazing. In the final analysis, the grassland is

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essentially a cow pasture, in which the dual effect of energy removal by grazing and cover reduction limit the diversity of both the flora and the fauna.

Although the vegetation of the Rancho Seco area is basically all annual grassland, it is not homogeneous. A number of local associations are discernible:

The "Upland" Annual Grasslands is distinguished as land which is relatively well drained, not containing areas of standing water, and dominated by grasses and forbs (broad-leaved plants) characteristic of annual grasslands.

The Vernal-Pool Areas (commonly known as Hog Wallows) correspond to the extent of hardpan Redding soil. The vernal-pool areas, generally about 1-1/2 to 2 miles to the southeast and east of the site, consist of rolling topography underlaid by hardpan. Winter rains fill the depressions to begin the annual cycle of vernal-pool development. The plant species of vernal pools are quite unique to this kind of habitat, and the vernal pools tend to retain their unique character except when insufficient rainfall allows typical annual grassland species to successfully invade the vernal pool areas. Often vernal-pool basins will remain bare or have only a few nonvernal species during the dry season.

4.8.3 The Fauna of Rancho Seco

The list of vertebrate species which could potentially occur in the Rancho Seco area is quite long. Mouse burrows and meadow-vole runs (*Microtus californicus*) are common, especially where there is cover and where water is nearby. Pocket gophers (*Thomomys bottae*) are the most common mammal on site. Cattle grazing reduces low ground cover that is valuable to common species such as jack-tailed rabbit (*Lepus californicus*) and California quail (*Lophortyx californicus*).

Skunk and raccoon signs are seen near water. Several species of water-fowl, including geese, are common. Grassland birds (savannah sparrows, Brewer's blackbirds, meadowlarks, and horned larks) and various raptors (redtailed hawks, turkey vultures, sparrow hawks) are sighted frequently. The most important natural consumer is the gopher (*Thomomys bottae*), but cattle pastured by man are the most important faunal species affecting the vegetation.

The cattle are the dominant consumers. The next largest herbivore is probably the jackrabbit; the site is not a suitable deer habitat, because of the lack of browse and cover.

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Feral cats are numerous and may be the dominant carnivores, especially on smaller ground-nesting birds.

The fauna is probably most diverse during the winter and early spring. Many migratory bird species use the area during the late fall and winter, but leave during the spring to breed in other areas. Populations of the resident species, especially the mammals, can be expected to fluctuate seasonally from high densities near the end of the growing season to low densities at the end of the dry season.

The major limitation on the diversity of fauna in the grassland is the extremely simple structure of the vegetation, consisting almost solely of short, close-cropped grasses and forbs. The lack of tall, herbaceous and shrubby vegetation makes the area unsuitable for species requiring this type of vegetation for foraging, nesting, roosting, or resting sites.

The species in the Rancho Seco grassland are generalist feeders, well adapted to disturbance, and in general not dependent upon heavy cover. Species that are sensitive in one way or another are restricted to a few suitable areas, principally near the reservoir, ponds, or streams. This reaffirms the substantial impact of the cattle on the natural faunal elements of the ecosystem.

The Rancho Seco ecosystem, as water limited as it is, has responded strongly to the additional water resulting from the operation of RSNRS. Riparian elements are invading areas where year-round moisture is available, and a number of waterfowl/wading-bird species are using the area. These elements are expected to use the ecosystem seasonally, coinciding with the vegetative growth cycle, and to provide interchange between Rancho Seco, the Delta, and other aquatic habitats.

Mud Swallows have used areas on the outside of the Reactor Building and cooling towers as seasonal nesting areas. These nesting areas will remain undisturbed during Custodial and Hardened-SAFSTOR. Prior to beginning Deferred-DECON, the District will evaluate what effect demolishing these structures will have on the swallows.

The fish fauna of the reservoir were partially introduced and are heavily managed. The role of the fish and the reservoir as part of the trophic web of the Rancho Seco grassland has not been clarified, although the lake itself provides an important riparian ecotone that probably increases use of the grassland, particularly by birds.

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CHAPTER 5

ENVIRONMENTAL IMPACTS OF PROPOSED ACTION

5.1 INTRODUCTION

The principal environmental effects of decommissioning activities are radiation exposure and the disposal of radioactive waste. Decommissioning Rancho Seco is expected to have a minimal and insignificant adverse environmental impact. The beneficial impacts include eliminating the problems associated with a radioactively contaminated facility and the potential reclamation of the land for other productive uses.

Pursuant to the District's proposed plan, decommissioning Rancho Seco should impose no significant threat to public health and safety. The adverse effects associated with decommissioning include routine occupational radiation exposure and the commitment of land for radioactive waste disposal. As discussed in NUREG/CR-0130, radiation exposure to the public should be minimal, even when accidental airborne radioactive releases are considered. The low probability, worst case exposure to an individual from an accident involving a truck transporting radioactive waste to a disposal facility is projected to be small.

The environmental effects typically discussed in environmental reports address the consequences of building a new facility that may require land; labor; capital investment; materials; continuing use of air, water, and fuel; socioeconomic infrastructure; etc. Decommissioning is an action to restore the site and its environs towards their original condition, requires a much smaller commitment of capital resources than building and operating a new facility, and generally contributes to the natural resources.

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**5.2 RADIOLOGICAL IMPACTS**

**5.2.1 Occupational dose**

SAFSTOR with Deferred-DECON results in lower radiation doses to both workers and to the public than DECON. NUREG/CR-0130 shows the aggregate occupational radiation dose to be approximately 460 person-rem for a 30-year safe storage (420 person-rem from safe storage preparation, 14 person-rem for continuing care and surveillance, and 24 person-rem from deferred decontamination), not including transportation. This compares to an estimated dose of 1200 person-rem for immediate dismantlement. As discussed in Section 2.2.3 of the DP, the total dose estimate for Custodial and Hardened-SAFSTOR is 135 person-rem.

In accordance with NUREG/CR-0130, the occupational radiation dose from the truck transport of radioactive wastes was calculated to be about 14 person-rem. A 100-year SAFSTOR stage would result in little additional reduction in the aggregate occupation radiation dose compared to 30-year safe storage.

During decommissioning, RSNRS will continue to maintain an ALARA program in accordance with 10 CFR 20, Regulatory Guide 8.8 "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable," and Regulatory Guide 8.10 "Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable." The RSNRS ALARA policy states the management commitment to maintain exposures ALARA to workers and the public. This commitment is contained in the USAR and is implemented by plant administrative procedures and Radiation Protection Department implementing procedures.

**5.2.2 Offsite Dose**

With SAFSTOR, the environmental effects of radiation dose and radioactivity released to the environment will be substantially less than the environmental effects resulting from reactor operation and maintenance. Radiation doses to the public from airborne radionuclides released during preparation for Custodial-SAFSTOR are estimated to be very small.

According to NUREG/CR-0130, the radiation dose to the public from the truck transport of radioactive wastes during preparation for SAFSTOR is estimated to be about 2.1 person-rem.

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Calculated radiation doses to the maximum-exposed individual from postulated accidental airborne radioactivity releases during decommissioning activities are low. Based on the most severe transportation accident scenario, NUREG/CR-0130 calculated the radiation dose to the maximally exposed individual to be 24 rem (50-year dose commitment) to the lungs. The frequency of such an accident was conservatively estimated to be  $5.7E-4$  for the SAFSTOR period.

Exposure from the ISFSI to the nearest permanent resident will not exceed 25 millirems per year as specified in 10 CFR 72.104 and 40 CFR 190. Actual dose rates will be dependent on the number of casks in storage, as well as fuel burnup, enrichment, and age. Design specifications for the ISFSI will preclude airborne radioactive releases during cask storage and transport and provide adequate shielding to minimize exposure. Radiation monitoring for construction workers will be performed in accordance with the Rancho Seco Radiation Protection Program. Under a worst case scenario, in which there is total loss of the confinement barrier surrounding the storage area, it is projected that resulting doses at the site boundary would be substantially below the limits established in 10 CFR 72.106(b).

### 5.2.3 Radioactive Waste

The production of radioactive waste will be minimal during Custodial and Hardened-SAFSTOR. The increased generation of radioactive waste during Deferred-DECON will be addressed in greater detail when the DP is revised prior to implementing that phase of decommissioning.

**Waste Processing, Storage, and Disposal.** Solid radioactive wastes will be generated by processing liquid and gaseous waste, activated and contaminated components, and occupational exposure to radiological contamination. Prior to Custodial-SAFSTOR, liquid and solid radioactive wastes will be processed onsite using existing plant radwaste systems. To process radioactive liquids, the plant will use a combination of methods, including filtration, demineralization, evaporation, solidification, or shipment to a licensed offsite facility for incineration. After processing, wastes will be stored onsite until they are shipped to licensed decontamination or disposal sites. Shipping of radioactive materials will be performed in full compliance with the requirements of 10 CFR 71 and 49 CFR 173-179.

High-level waste (e.g., spent fuel, reactor vessel, and other components greater than Class C) may be either transferred to a

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Monitored Retrievable Storage (MRS) facility or a federal waste repository. The DOE has indicated that a MRS facility will be operational about 1998, and a federal repository will not be available until at least 2010.

The ISFSI will not generate any gaseous, liquid, or solid radioactive waste, and no hazardous chemicals will be used during its operation. Decontamination of the casks will take place in the Fuel Storage Building before the casks are transferred to the ISFSI. Descriptions of cask decontamination and radioactive waste treatment processes are provided in Chapters 9 and 11 of the Rancho Seco USAR. During construction of the ISFSI, any chemical liquid wastes will be deposited or discharged into tanks for salvage or subsequent removal to offsite locations. Chemical liquid wastes will not be handled or stored in close proximity to major drainage areas, thereby avoiding potentially damaging spills to the site outfall.

The volume of waste expected to be generated during decommissioning is discussed in more detail in Section 3.1.4 of the DP. The management of radioactive waste is discussed in Section 3.3 of the DP.

#### 5.2.4 Mixed Waste

Radioactive mixed waste streams will be subject to regulation by both EPA and NRC. This regulatory system requires waste handlers formerly regulated exclusively by NRC to also comply with the EPA's Resource Conservation and Recovery Act (RCRA) regulations for hazardous waste management. The mixed waste will be stored in accordance with the requirements of 40 CFR 265 and 10 CFR 50.

#### 5.2.5 Proposed Residual Radioactivity Limits

The District will conduct its Final Radiation Survey of Rancho Seco after the completion of Deferred-DECON, estimated to be 2011. Because of the extended time between the submittal of the DP and the Final Radiation Survey, as well as the lack of issued federal guidelines, the District believes it would not be prudent to propose residual radioactivity release limits at this time.

The District will propose residual radioactivity limits in compliance with the regulations in effect at the time the Final Radiation Survey is performed. The revised DP and environmental report, to be submitted prior to the start of Deferred-DECON, will provide the residual radioactivity limits.

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**5.3 ENVIRONMENTAL EFFECTS OF ACCIDENTS**

**5.3.1 Credible Accidents During SAFSTOR**

The primary difference between an operating nuclear power plant and a plant in SAFSTOR is the range of postulated accidents that must be dealt with and the potential radiological consequences of abnormal plant conditions. RSNRS Updated Safety Analysis Report (USAR) Chapter 14, contains two accidents or conditions that continue to be applicable during SAFSTOR:

- o Fuel handling accident
- o Complete loss of offsite power (LOOP).

An additional event considered for Custodial-SAFSTOR is the drop of a spent fuel cask. Because of the many mechanical and electrical interlocks and administrative controls associated with the Turbine Building Gantry Crane, which are designed to prevent movement of a cask over spent fuel assemblies, dropping a cask onto spent fuel assemblies is not considered a credible event.

In addition, plant configuration and crane interlocks prevent a spent fuel cask from being lifted to a height of more than 26 feet in air or 33 feet 6 inches in water during the cask transport process. Pursuant to 10 CFR 71, casks are required to be rated for a 30 foot drop in air. A 30 foot drop in air is equivalent to more than a 40 foot drop in water; therefore, integrity is assured in the unlikely event of a dropped cask.

**5.3.1.1 Fuel Handling Accident**

The short-lived isotopes in the spent fuel at RSNRS have undergone substantial radioactive decay since the plant shutdown on June 7, 1989. Thus the source term for a credible accident during Custodial-SAFSTOR is significantly less than that for an operating plant. Essentially, there is no radioactive iodine present in the plant; therefore, iodine will not have a significant dose impact on members of the public. The total calculated thyroid dose from credible accidents in the Permanently Defueled Mode (PDM) is less than 1 mrem.

A District calculation, dated May 16, 1990, showed that the primary radioisotope of concern from an offsite exposure (dose) standpoint following the dropped fuel assembly accident (the maximum credible accident during SAFSTOR) is Kr-85. Results of the analysis for the dropped fuel assembly accident in the current defueled condition show that the 2-hour integrated total body dose attributed to the maximum exposed individual is 0.013 rem. This calculated dose is

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a small fraction of the 10 CFR 100 accident dose limit (25 rem) and is significantly less than the annual dose limit of 10 CFR 20 (0.5 rem) or the plume exposure Protective Action Guidelines (PAG). The District expects some fuel handling activities while the plant is in Custodial-SAFSTOR to support the dry cask storage of the fuel at the ISFSI.

**5.3.1.2 Complete Loss of Offsite Power (LOOP)**

During normal plant operations, it is important that electrical power be available to support equipment needed to operate the plant and mitigate the consequences of an accident. During Custodial-SAFSTOR, a LOOP would result in the loss of the Spent Fuel Cooling System (SFC). However, there is adequate time available to take corrective action without a safety consequence in the event of a LOOP.

RSNGS has six offsite power transmission lines and has the capability to receive power from either the District or Pacific Gas and Electric in less than 8 hours. An evaluation of the offsite electrical grid for RSNGS performed pursuant to 10 CFR 50.63 "Loss of All Alternating Current Power" (Station Blackout) verified the stability of the Western grid.

The probability of a LOOP at RSNGS, as evaluated in accordance with the guidelines of Regulatory Guide 1.155, is less than once in 20 years. Therefore, the emergency diesel generators are not required to ensure power availability to support SFC equipment in the event of a LOOP. An alternate power supply can be made available well within the minimum time required to take corrective action to restore SFC. A LOOP will not result in a release of any significant amount of SFP inventory of radioactivity.

Spent Fuel Pool Decay Heat Load

The controls required to protect the spent fuel are predicated primarily on the level of decay heat from the spent fuel in the SFP. The decay heat load for the SFP in the defueled condition was calculated using the methodology described in ANSI/ANS 5.1-1979 and Branch Technical Position ASB 9-2.

Table 3-21 of the DP provides the length of time required for the SFP water to reach 212°F (i.e., boiling point of water), from an initial temperature of 120°F, and the time required to evaporate 6.75 ft of water from the SFP following a loss of SFC. The 6.75 ft measurement was chosen because SFP water level is normally maintained above 37 ft (the low-low level alarm) and, as evaluated in the PDTs Safety Analysis, must be maintained at 30 ft, 3 in. to

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limit the dose rate at the SFP surface to 2.5 mR/h when 1080 spent fuel assemblies that have decayed 3 days following irradiation at 100% power is stored in the SFP.

This SFP surface dose rate calculation is very conservative because the reactor was not operated at 100% power as assumed in the dose rate calculation, the number of spent fuel assemblies stored in the SFP is much less than 1080, and the actual decay time of the 493 spent fuel assemblies in the SFP is significantly higher than the 3 days assumed. No safety implication exists for a significantly lower SFP level as long as personnel exposure is monitored and maintained ALARA.

As shown in Table 3-21 of the DP, upon a loss of SFC on June 7, 1991, the minimum time required to reach boiling in the SFP is 143 hours. Thus, a minimum of 6 days is available to restore SFC prior to the occurrence of boiling following a loss of SFC. In addition, if the additional time available through boil-off of 6.75 ft of the 37-ft normal minimum water depth is taken into account, a minimum of 17.7 days (as of June 7, 1991) is available to implement corrective actions to restore level and cooling capability. If boil-off of SFP water were to occur due to a loss of SFC, the simple addition of water to the SFP would extend the time to implement corrective actions to restore SFC.

No degradation effects on the fuel and cladding is associated with SFP boiling because the fuel is designed to operate at significantly higher coolant temperatures than 212°F. The effect of thermal stresses on the structural supports of the SFP have been analyzed and found acceptable up to a SFP temperature of 212°F. Therefore, a 212°F SFP temperature does not impose a safety hazard.

### 5.3.2 Accidents During Deferred-DECON

During Deferred-DECON, the District will perform selective decontamination and dismantlement of systems, components, and structures in addition to maintenance, waste management, and surveillance. In general, the accidents discussed in NUREG/CR-0130 associated with immediate dismantlement would be applicable to Deferred-DECON. However, the consequences of these accidents will be less because of the reduction in radionuclide inventory from preliminary decontamination, prior shipments of radwaste, and radioactive decay.

Operational accidents during Deferred-DECON are the result of events such as equipment failure, human error, and service

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conditions. If it is assumed that fuel has been removed from the site prior to beginning Deferred-DECON, operational accidents can be categorized as:

- o Transportation accidents involving radioactive materials
- o Explosions and/or fires associated with explosive/combustible materials
- o Loss of contamination control
- o Natural phenomena
- o Human-caused events external to RSNGS

These potential events have been addressed in NUREG/CR-0130 for immediate dismantlement. The anticipated deferred decontamination operations at RSNGS and accident potential are within the NUREG/CR-0130 considerations.

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5.4 PUBLIC SERVICES AND SOCIOECONOMIC IMPACTS

5.4.1 Impact

Any socioeconomic impact that may have occurred when the plant ceased operation, and the income created by the plant was eliminated, is not an effect of the proposed radiological decommissioning. The decision to cease plant operations has been made by the District and is not subject to NRC review or approval.

Except for solid waste collection and disposal, the decommissioning process will require no additional public services.

The radiological decommissioning process itself may have various minor effects on the local economy due to changes in the plant's payroll and other types of expenditures. However, fiscal impacts of decommissioning are not expected to be significant for several reasons:

- o Employment at the plant has already been reduced to a relatively low level, so subsequent staffing reductions attributable to radiological decommissioning activities will not be large. Further, during Deferred-DECON, the decommissioning staff will be increased, providing jobs and local business opportunities.
- o Projected economic growth and job opportunities in the Sacramento metropolitan area should minimize effects of unemployment that would result from decommissioning.

Regarding the ISFSI, 480-volt supply lines will provide necessary electric power to the ISFSI. This facility will not require an ongoing water supply. During site preparation and construction, drinking water for workers and water for cleaning operations and dust control will be transported by truck. Portable restrooms for onsite personnel will be provided. Construction scrap and debris will be collected in designated areas for salvage, incineration, or burial. No sanitary waste discharges are anticipated from operation of the ISFSI.

In 1970, the District constructed and filled a storage reservoir (Rancho Seco Lake) to serve as a backup water source for the plant. This 165-acre reservoir was designed to hold a capacity of 2,700 acre-feet. Pumping from the Folsom South Canal, in combination with surface runoff, is designed to maintain a stable volume of water in Rancho Seco Lake. However, drawdowns from the lake have occurred occasionally when required by reduced pumping from the Folsom South Canal.

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Rancho seco Lake served as a back-up water supply for the plant cooling and fire systems. Water for plant use is pumped from Folsom South Canal, located approximately 3.5 miles west of the plant site, through an underground pipeline. The District's contract with the U.S. Bureau of Reclamation allows the District to draw up to 32 cubic feet per second (cfs) from this source.

**5.4.2 Mitigation**

The District will take the following measures to minimize any impact on Rancho Seco Lake or required public services:

- o Honor existing commitments for maintenance of the reservoir at Rancho Seco Park until 2022.
- o Prior to abandoning any water management facilities onsite or at Folsom South Canal, discuss the potential effects on Rancho Seco Lake with the Sacramento County Park Department and assist in developing an agreement that will provide for maintaining water quality at the lake.
- o Cooperate in the implementation of waste reduction and other measures to facilitate collection and offsite disposal of non-radioactive solid waste material, and to minimize impacts on existing disposal facilities.

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5.5 NATURAL RESOURCES

5.5.1 Impact

Disturbance of the ground cover will generally be minimal, except for excavation, filling, and grading activities associated with removal of underground structures during Deferred-DECON. Where ground contamination concentrations exceed the release criteria, removal of contaminated material may require excavation of soil and ground cover. Interruption or cessation of operational discharges from the plant into Clay Creek, which are currently continuous, could cause creek drainage to revert to their natural states as modified by irrigation runoff and thereby affect the riparian habitat in this area.

Various decommissioning activities will result in temporary increases in consumption of energy, water, construction materials, and other resources. Waste hauling and other transportation activities associated with the project will result in increased short-term fuel consumption. Decontamination activities may involve short-term use of industrial cleaning products. The impact of radiological decommissioning on air quality will be controlled and will be insignificant.

As to the ISFSI, the District proposes to clear all vegetation from the ISFSI construction area and to excavate to approximately 6 feet below grade. The proposed ISFSI site, consisting primarily of grassland and an asphalted surface, has no known unique natural resource or habitat value. After the soil is replaced as necessary by suitable fill, it will be compacted and the concrete slab will be formed using ready mix concrete. Construction of the ISFSI will increase the impermeable surface area and runoff, but effects on drainage, vegetation, and offsite land uses will be minor.

Runoff will be directed to the outfall at the southwest boundary of the project site. Excavated material or fill will not be discharged into existing water bodies. Due to the low water table, no dewatering during excavation is anticipated. However, a permanent drainage system already exists to collect any runoff that may be generated onsite and will be maintained for this purpose to minimize erosion. Drainage from spoil areas will be designed to follow natural drainage patterns.

Erosion will be controlled by providing drainage, intercept, and berm ditches; controlling slope angle; and reseeding disturbed areas with grass or other ground cover where feasible. Spoil areas, used for storage during excavation, will be filled and graded to minimize potential erosion before turf cover is

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established. Maintenance will be performed until the turf has stabilized to correct local areas of excessive erosion or inadequate turf cover.

**5.5.2 Mitigation**

The District will take the following measures to mitigate the impact on any natural resources:

- o Prior to authorizing actions that could result in termination or substantial alteration of current water discharges, the District will conduct an assessment of potential effects on the creek environment and maintenance of Rancho Seco Lake. Measures to minimize environmental impacts identified by the District and responsible or trustee agencies will be implemented, as appropriate.
  
- o Prior to any substantial change in water discharges that could affect the creek system and riparian habitat in the vicinity, the District will discuss potential effects with responsible and trustee agencies and will cooperate in efforts to maintain these resources.

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5.6 TRANSPORTATION AND NOISE

5.6.1 Impact

Shipping spent fuel and low-level waste during Deferred-DECON may impact existing transportation systems in the site vicinity due to increased heavy truck traffic. The activities expected to generate noise include site clearing, hauling of fill, soil compaction, concrete pouring, and construction of the ISFSI. The transfer of spent fuel from the Fuel Storage Building to the ISFSI will generate a minimal amount of noise. Due to the remote location of the site and the size and nature of the facility, effects of increased noise associated with the construction and operation of the ISFSI will not be significant.

5.6.2 Mitigation

The District will take the following measures to mitigate any impact on transportation and noise:

- o Cooperate in the implementation of transportation control measures to minimize traffic impacts in the vicinity.
- o Limit construction activities to normal working hours and providing trucks and other mechanical equipment with standard noise control devices.

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**CHAPTER 6**

**ALTERNATIVES TO PROPOSED ACTION**

**6.1 DECOMMISSIONING ALTERNATIVES**

As the licensee responsible for decommissioning Rancho Seco, the District has reviewed all of the decommissioning alternatives (i.e., DECON, ENTOMB, and SAFSTOR), as described in NUREG-0586 "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities." A review of the decommissioning alternatives not selected is provided in the following sections.

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**6.2 OTHER DECOMMISSIONING ALTERNATIVES**

**6.2.1 DECON**

DECON is the only decommissioning alternative which leads to the termination of the facility license and the release of the facility for unrestricted use shortly after termination of facility operations. DECON is estimated to take from one to two years for small facilities and up to approximately six years for a large PWR such as RSNGS.

Because all of the DECON work is completed within a few years following shutdown, personnel radiation exposures are generally higher than the other decommissioning alternatives. Other alternatives spread the decommissioning work over longer time periods, taking advantage of radioactive decay. Similarly, larger commitments of cash flow and radioactive waste disposal facilities are required.

The primary advantage of DECON is terminating the facility license earlier and making the facility and site available for some other beneficial use. DECON is accomplished at the expense of larger initial commitments of money, personnel radiation exposure, and waste disposal site space. Other advantages of DECON include the availability of the present work force who are highly knowledgeable about the facility and the elimination of the need for long-term security, maintenance, and surveillance of the facility.

In DECON, nonradioactive equipment and structures need not be torn down or removed as part of a decontamination procedure for termination of the NRC license and release of the site for unrestricted use. Once the radioactive structures are decontaminated to levels permitting unrestricted use of the facility, they may be put to some other use.

The District rejected the DECON alternative for the following reasons:

1. Spent fuel is currently stored at RSNGS and no approved or acceptable option is available for offsite disposal of spent fuel. The fuel must be stored in the SFP until it has decayed long enough to be placed in dry storage casks, and stored onsite until the DOE is ready to accept it.
2. The radiation levels are significant in controlled areas. Immediate DECON would result in radiation exposures to

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individuals performing decontamination tasks. Deferred-DECON will allow some of the radioactivity to decay. Additional cost would be incurred to keep exposure ALARA.

3. Immediate DECON would result in increased costs because of the greater radioactive waste Curie content when compared to allowing for radioactive decay. Immediate decontamination of equipment and components will require disposing of somewhat larger quantities of waste.
4. Dismantling a large scale reactor vessel has not yet been demonstrated for a reactor the size of RSNGS and the cost to develop the necessary technology may prove to be highly expensive. Waiting will allow for the development of improved technology.
5. SAFSTOR with Deferred-DECON will allow a reasonable period to accumulate funds for dismantlement.

Another version of the DECON alternative is partial DECON with spent fuel stored onsite. For this alternative, the Reactor Building and other onsite structures, except the Fuel Storage Building, would be decontaminated to levels permitting unrestricted use. The SFP, Auxiliary Building, and associated systems would be maintained operational during the fuel storage periods. Once the fuel was shipped offsite or stored dry at the ISFSI, the SFP, Fuel Storage Building, and portions of the Auxiliary Building used to support fuel storage would be hardened and later decontaminated to unrestricted use levels.

The District rejected the partial DECON alternative for the following reasons:

1. Partial DECON provides no significant advantage over complete DECON because the radiation exposure estimates and the cost of decommissioning are essentially the same for both.
2. Waiting will allow for the spent fuel to decay before being put into dry storage and for improved decommissioning technology.
3. Partial DECON would require an unreasonable acceleration of decommissioning funding.

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**6.2.2 ENTOMB**

ENTOMB is the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete. The entombed structure is appropriately maintained and continued surveillance is maintained until the radioactivity decays to a level permitting release of the property for unrestricted use.

The ENTOMB alternative requires the facility to contain radioactive materials for the lifetime of the structure and relies on radioactive decay to reduce residual radioactivity to a level permitting unconditional release.

The District rejected the ENTOMB alternative for the following reasons:

1. The time required for RSNRS' radioisotopes to decay to a level permitting unrestricted release significantly exceeds the 60-year period established by the Commission in the Decommissioning Rule, 10 CFR 50.82.
2. ENTOMB would require dedication of the site as a radioactive waste burial ground for greater than 100 years. This conflicts with the EPA guidance that limits the use of institutional controls to protect the public from hazards of retired nuclear facilities to a period of 100 years (EPA, 1978).

Therefore, ENTOMB is not a reasonable alternative for RSNRS.

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**CHAPTER 7**

**STATUS OF COMPLIANCE**

Adequate decommission planning ensures that public health and safety will be protected during the license termination process. In accordance with the requirements in 10 CFR 50.82, the District has submitted a Proposed Decommissioning Plan for NRC approval. In that plan, the District described its proposed method of decommissioning RSNRS (SAFSTOR with Deferred-DECON). The plan also provides:

- o A description of decommissioning activities.
- o A description of controls and limits on procedures and equipment to protect occupational and public health and safety.
- o A description of the final radiation survey.
- o An updated cost estimate for the SAFSTOR alternative, comparison of that estimate with present funds set aside for decommissioning, and a plan for assuring the availability of adequate funds to complete decommissioning.
- o A description of technical specifications, quality assurance provisions, and physical security plan provisions in place during decommissioning.

A Financial Assurance Plan has also been submitted to the NRC for approval. In that plan the District committed to provide "financial assurance" through an external sinking fund. The fund will started with an initial contribution of \$90 million from an existing internal decommissioning fund and continued annual contributions of \$12 million until the end of RSNRS's operating license, in 2008. At that time, \$281 million will have been collected. Concurrently, funds for SAFSTOR operations will be dispersed from the fund annually. The decommissioning cost (estimate) study will be reviewed annually to adjust cost levels. Funding levels will be adjusted periodically, not to exceed five years.

The District has established guidelines for maintaining drawings and records important to decommissioning. Specifically, records of spills or other unusual occurrences involving the spread of

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contamination; as-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored and locations of inaccessible contamination; and records of the cost estimate for the decommissioning funding plan.

Finally, the District has submitted this Environmental Report to the NRC for approval. As described, decommissioning planning, including radiation dose and waste management, and financial assurance provisions for RSNGS have been examined and "no significant impacts" have been identified.

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CHAPTER 8

SUMMARY AND CONCLUSIONS

In consideration of the Decommissioning Rule, the information provided in the GEIS and supporting data base, and this environmental report, the District concludes:

The knowledge and technology for safely storing and decommissioning a nuclear facility such as RSNRS, is available. While technical improvements in decontamination and dismantlement techniques may evolve with time, safe-storage at the present time can be accomplished safely and at a reasonable cost. Radiation dose to the public due to preparation for safe-storage and decontamination activities, such as transportation of low level waste to burial facilities, is expected to be low. Radiation dose to workers at Rancho Seco is expected to be a small fraction of their lifetime exposure and well within the exposure limits imposed by regulatory requirements.

The decommissioning of a nuclear facility generally has a positive environmental impact. At the end of facility operation, termination of the nuclear license is the goal. Termination requires decontamination of the facility to a level low enough that residual radioactivity remaining in the facility or on site meets regulatory release criteria, allowing unrestricted use of the site. For RSNRS, the commitment of resources for decommissioning is expected to be small. The major environmental impact of decommissioning is the commitment of land for waste burial in exchange for reuse of the facility and site for other purposes. In many instances, such as Rancho Seco, the land is a valuable resource, and return of this land to the commercial or public sector is a valuable environmental effect.

## Chapter 10. Biological Resources

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This chapter discusses the plant communities and wildlife at the 1,600-acre Rancho Seco Park site, assesses the impacts on these resources from various project alternatives, and recommends mitigation measures to minimize or compensate for expected impacts.

Jones & Stokes Associates' biologists conducted extensive field surveys, reviewed pertinent literature, and contacted knowledgeable individuals to accumulate the information in this chapter. Sources consulted include a records search of the California Department of Fish and Game's (DFG's) Natural Diversity Data Base (NDDB), Smith and Berg (1988), Jones & Stokes Associates file information (including information on surveys conducted by Jones & Stokes Associates for SMUD on an adjacent parcel), and knowledgeable individuals (Skinner, Brewer, and Brode pers. comms.).

Field surveys to delineate wetlands, map plant communities, and located special-status species were conducted between February and August 1993. Surveys for special-status plants employed methods recommended by DFG (1984) and Nelson (1987). Surveys for special-status plants were conducted in 1993 on April 28 and 30, May 1 through May 7, and May 12 for early-blooming plant species and on June 3, 11, 15, and August 10 for late-blooming species. Survey timing was adjusted to accommodate the later flowering period observed throughout the Central Valley in 1993.

Surveys for special-status wildlife species were conducted on February 8, 9, 10, and 19; March 5 and 19; April 3; and May 19, 20, and 21, 1993, to target the different wildlife species with potential to occur at the site.

### SETTING

The project site is characterized by rolling hills of grassland with seasonal wetlands interspersed in low-lying areas. Undeveloped portions of the site support an extensive and relatively dense occurrence of vernal pools and swales interspersed with annual grasslands. Portions of the site are seasonally grazed by livestock, and several stock ponds have been created to provide water to livestock. Larger stock ponds support riparian woodland vegetation. Small irrigated pasture areas, some of which are fallow, are found in the southeastern quarter of the site.

The project site supports 12 plant communities: annual grassland, irrigated pasture, ornamental plantings, vernal pool, vernal swale, seasonal wetland, seep, emergent marsh,

juncus meadow, willow riparian, ephemeral drainage, and open water. Each plant community and its associated vegetation and wildlife functions and value are briefly described below. A summary of plant communities and acreages is provided in Table 10-1.

### **Nonwetland Communities**

Nonwetland communities at the site (i.e., communities that were determined not to be jurisdictional wetlands by the U.S. Army Corps of Engineers [Corps] pursuant to Section 404 of the Clean Water Act [Jones & Stokes Associates 1993b]) include annual grassland, irrigated pasture, and ornamental vegetation.

#### **Annual Grassland**

Annual grasslands dominate the project site and are dry through summer. This seasonally dry habitat is characterized by a dominance of naturalized non-native grasses that cover the hilltops and well-drained uplands and surrounding areas. Annual grasslands have a dominance of wild oat, ripgut brome, soft chess, small fescue, and medusa-head grass.

Annual grasslands provide most of the forage for livestock; grazing pressure varies from moderate to heavy in the area. Grazing enhances community quality for some wildlife species (e.g., savannah sparrows, horned larks, and California ground squirrels) but reduces it for others (e.g., northern harriers, gopher snakes, and western rattlesnakes).

Many wildlife species use grasslands for foraging and breeding. Grasslands near open water, wetlands, and riparian communities are used by the greatest number of wildlife species. Grasslands adjacent to wetlands are used for foraging, breeding, and overwintering by the tricolored blackbird and western pond turtle and possibly by the tiger salamander (see "special Status Wildlife Species", below); these species and are found in communities similar to those found on the project site. Amphibian and reptile species living in grasslands include the Pacific treefrog, western fence lizard, and gopher snake. Birds known to forage in grasslands include the horned lark, savannah sparrow, tricolored blackbird, Brewer's blackbird, and western meadowlark. Mammals that forage or breed in grasslands include deer mice, California ground squirrels, striped skunks, and coyotes.

Small mammals in grasslands are important prey for a variety of predatory birds and mammals, such as American kestrels, red-tailed hawks, black-shouldered kites, northern harriers, and coyotes.

Table 10-1. Summary of Plant Communities and Acreages at the Rancho Seco Park Site

Habitat Types	Wetland Communities <sup>a</sup> (acres)	Nonwetland Communities (acres)	Total Acres
Annual grassland/developed areas <sup>b</sup>	--	1,310.63	
Vernal pool	20.25	--	
Vernal swale	3.37	--	
Emergent marsh	1.92	--	
Open water	154.59	--	
Willow riparian woodland	13.75	--	
Irrigated pasture	--	89.89	
Juncus meadow	1.15	--	
Seep	0.53	--	
Ephemeral drainage	3.81	--	
Seasonal wetland	<u>0.11</u>	<u>--</u>	
Subtotal	199.48	1,400.52	
Total			1,600.00

<sup>a</sup> Wetland communities include areas identified by the Corps as jurisdictional waters of the United States, including wetlands (Jones & Stokes Associates 1993b).

<sup>b</sup> Acres reported for annual grassland/developed areas include roads, buildings, and existing landscaped park facilities.

Source: Jones & Stokes Associates 1993a.

## **Irrigated Pasture**

The four irrigated pastures on the site are large parcels that are currently or were historically irrigated during the dry season, grazed by livestock, and dominated by non-native grass and forbs species. One pasture has been abandoned and is no longer irrigated; this pasture is dominated by Mediterranean barley. The other three irrigated pastures have a prevalence of sedge, bird's-foot trefoil, Bermuda grass, rabbit's-foot grass, and annual bluegrass.

Although cattle grazing keeps the irrigated pasture vegetation too low and sparse for it to provide good nesting habitat, it does provide some foraging habitat for raptors, songbirds, rodents, and snakes. Raptor species that may forage in the irrigated pasture include red-tailed hawks, northern harriers, American kestrels, great horned owls, and barn owls. Wildlife species observed in the irrigated pastures include black-tailed hares, killdeer, savannah sparrows, Brewer's blackbirds, brown-headed cowbirds, tricolored blackbirds, black-shouldered kites, and western meadowlarks.

## **Ornamental Vegetation**

Ornamental vegetation was planted for or "volunteered" as a result of landscaping of the park and rural residential areas on the project site. The ornamental community is dominated by cultivated tree species, including weeping willow, fruitless mulberry, elm, juniper, oleander, magnolia, redwood, and blue gum.

Ornamental trees growing near houses and in the park are used for perching by raptors such as red-tailed hawks and American kestrels. Ornamental trees provide nesting and foraging habitat and cover for common bird species that use non-native plant species, including American robins, American crows, northern mockingbirds, white-crowned sparrows, Anna's hummingbirds, and house finches. Mammals such as Virginia opossums and brush rabbits were also observed during surveys visiting this plant community.

## **Wetland Communities**

Wetland communities (i.e., those communities determined to be jurisdictional wetlands by the Corps pursuant to Section 404 of the Clean Water Act [Jones & Stokes Associates 1993b]) include vernal pool, vernal swale, seasonal wetland depression, seep, emergent marsh, juncus meadow, willow riparian, ephemeral drainage, and open water habitat.

## **Vernal Pool**

Vernal pools are seasonally flooded landscape depressions that support a distinctive biota adapted to periodic or continuous inundation during the wet season and have an absence of either ponded water or wet soil conditions during the dry season. The vernal pools on the site are typical of vernal pools throughout the Sacramento Valley. Vernal pool basins are dominated by coyote thistle, Fremont's goldfield, stipitate popcorn flower, woolly marbles, spike-primrose, common spike rush, hedge-hyssop, toad rush, water-starwort, and American pillwort. One vernal pool supports a large population of Greene's legenera and a small population of Boggs Lake hedge-hyssop, both Category 2 candidates for federal listing. Another vernal pool supports a small population of viscid orcutt grass, proposed for federal listing as endangered.

Vernal pools support a wide diversity and abundance of aquatic invertebrates and plant species, which in turn are food for vertebrate wildlife. Wildlife species observed foraging in vernal pools include great blue herons, mallards, cinnamon teals, common snipes, killdeer, greater yellowlegs, bullfrogs, Pacific treefrogs, and western garter snakes.

## **Vernal Swale**

The project site is traversed by swales arranged in integrated or dendritic drainage patterns with vernal pools. Vernal swales convey runoff during and for short periods after rainfall. Some vernal swales connect some vernal pools, thus filling or draining them, while others meander through vernal pool terrains but do not physically connect with individual vernal pools. Vernal swales are dominated by Mediterranean barley, coyote thistle, Italian ryegrass, toad rush, slender fescue, hairgrass, quaking grass, tarweed, and spikeweed.

Vernal swales have wildlife values similar to those of vernal pools and provide some foraging habitat and drinking water for birds, mammals, and other wildlife during the rainy season. Vernal swales are usually too ephemeral, however, to support an abundance of wildlife. Species observed using this habitat include Pacific treefrogs (tadpoles), western meadowlarks, western kingbirds, western bluebirds, scrub jays, and a variety of aquatic invertebrates.

## **Seasonal Wetland Depression**

Seasonal wetland depressions are characterized as seasonally wet areas that exist in shallow to deep depressions underlain by slowly permeable soils. Ruderal seasonal wetlands are present on the project site in the irrigated pasture. The largest seasonal wetland is an abandoned agricultural ditch that was originally used to return sheet flow from the irrigated pasture to an adjacent stock pond. Seasonal wetlands support mostly non-native species, including bird's-foot trefoil, curly dock, manna grass, common spike rush, and Mediterranean barley.

Seasonal wetlands on the project site provide some foraging habitat and drinking water for birds, mammals, and other wildlife during winter and spring. Amphibians such as Pacific tree frogs and western toads may be dependent on these wetland types.

### **Seep**

Seeps on the project site are present below stock pond dams where water slowly oozes or seeps from the ground to the surface, saturating the soil. Seeps are dominated by toad rush, Mediterranean barley, Italian ryegrass, common spike rush, Bermuda grass, bird's-foot trefoil, sedge, quaking grass, Baltic rush, yellow sweetclover, bog rush, slender fescue, and Dallas grass.

Seeps provide foraging habitat and cover for aquatic invertebrates and amphibians. Aquatic invertebrates inhabiting seeps are fed on by small mammals, amphibians, reptiles, and insectivorous birds.

### **Emergent Marsh**

Emergent marsh is dominated by perennial monocots that grow in permanently or semipermanently flooded/saturated soil conditions. Emergent marshes are dominated by common spike rush; however, some have broad-leaved cattail or tule. Emergent marsh is present along the margins of the lake and around larger stock ponds.

Emergent marshes provide high-quality foraging habitat, breeding habitat, and cover for many water birds, small mammals, reptiles, and amphibians. Emergent marshes in the project area provide important foraging habitat for fish-eating bird species, such as American bitterns, great blue herons, great egrets, and belted kingfishers. These aquatic habitats also attract mallards, American coots, common moorhens, and other water birds. Several species, such as marsh wrens, song sparrows, and red-winged blackbirds, nest in cattails and other emergent vegetation.

Wildlife species commonly using these habitats include great blue herons, mallards, cinnamon teals, marsh wrens, red-winged blackbirds, raccoons, common garter snakes, and Pacific treefrogs. Skunks, California voles, and house mice may also frequent the marsh habitats in the project area.

### **Juncus Meadow**

Juncus meadows are dominated entirely by bog rush. Juncus meadow habitats offer wildlife values similar to those of seeps, with the addition of escape and roosting cover provided by dense vegetative growth of juncus.

## **Willow Riparian**

The willow riparian woodland is found in a thin band bordering the lake and is characterized by native willow species with an overhead canopy cover exceeding 20%. The dominant species are Goodding's willow, with an occasional Fremont's cottonwood.

Willow riparian habitats provide cover, breeding, and foraging habitat in an area with little tree or shrub cover and are therefore used by a variety of wildlife species. The proximity of willow riparian habitat to the adjacent annual grassland in the project area increases its value to wildlife. Foliage-gleaning birds such as warblers and vireos forage in cottonwoods and thickets of willows, and purple finches and lesser goldfinches feed on willow buds and catkins. Flycatchers, northern orioles, and western kingbirds nest in the taller riparian trees and forage out over the surrounding juncus meadow, open water, and emergent marsh.

This community provides nesting and rearing cover for a variety of common birds, including scrub jays, song sparrows, house wrens, and Bewick's wrens. The trees in this community are used as perches by a variety of bird species, including double-crested cormorants, belted kingfishers, northern harriers, western kingbirds, barn swallows, tree swallows, red-tailed hawks, and great horned owls.

This community produces abundant aquatic and terrestrial invertebrates that are prey for amphibians and reptiles, such as Pacific treefrogs, common garter snakes, and western terrestrial garter snakes, and for insectivorous birds, such as yellow-rumped warblers, northern flickers, and Nuttall's woodpeckers. Small mammals found in riparian communities include shrews, voles, and mice.

## **Ephemeral Drainage**

Ephemeral drainages are unvegetated or sparsely vegetated channels with well-defined beds and banks that convey storm runoff only during and for a brief period after storms but are dry for the remainder of the year. The majority of the ephemeral drainages are narrow (1-3 feet wide) and deeply cut (1-3 feet deep); however, a few have average widths exceeding 5 feet. Although most ephemeral drainages are unvegetated, sparsely vegetated drainages are often dominated entirely by coyote thistle. Mediterranean barley, Italian ryegrass, toad rush, and common spike rush were also found during surveys in ephemeral drainages on the project site.

Ephemeral drainages, like vernal swales, provide habitat for a variety of wildlife species. Ephemeral drainages in the project area may provide seasonal habitats for amphibians; small mammals, such as raccoons and striped skunks; and water birds, such as egrets and herons, that feed on amphibians, aquatic reptiles, and invertebrates. Species observed using this community in the project area include Pacific treefrogs (tadpoles),

western meadowlarks, western kingbirds, western bluebirds, scrub jays, and a variety of aquatic invertebrates.

### **Open Water Habitat**

Open water habitat includes Rancho Seco Lake and several large stock ponds. This habitat typically has a water depth greater than 2 feet, which intergrades with emergent marsh at its fringes. Open water habitat is unvegetated or is sparsely vegetated with free-floating and submerged rooted aquatic plants, including pondweeds, lesser duckweed, mosquito fern, and mare's-tail water-milfoil.

The open water component of the stock ponds and Rancho Seco Lake provides moderate- to high-quality habitat for wildlife species. Rancho Seco Lake provides valuable year-round drinking, foraging, bathing, resting, and breeding opportunities for a variety of wildlife species. The willow riparian forest and tule/cattail marsh established around the ponds provide wildlife cover. This community provides drinking water for mammalian species such as mule deer, coyote, and gray fox. It also provides foraging habitat for raccoons and striped skunks that could feed on amphibians in the ponds, such as bullfrogs and Pacific tree frogs. The open water provides suitable foraging and resting habitat for dabbling ducks (mallards, gadwalls, and northern pintails) and other water birds, including American coots and pied-billed grebes.

Although stock ponds were developed to provide drinking water for livestock, they greatly enhance wildlife diversity in the area. Water birds, including a variety of waterfowl and shorebird species, use the ponds in winter. Mallards, cinnamon teals, gadwalls, and common goldeneyes use the ponds for foraging and resting. Other water-dependent animals forage or breed at stock ponds in the project area; these include great blue herons, snowy egrets, American coots, greater yellowlegs, belted kingfishers, bullfrogs, and Pacific treefrogs.

### **Special-Status Plant Species**

#### **Methodology**

Botanists compiled a list of special-status plant species that could occur at the Rancho Seco project site using several sources: a records search of the DFG's NDDDB (1993), Smith and Berg (1988), Jones & Stokes Associates (1990), Hoover (1935), Stone et al. (1988), Skinner (pers. comm.), and Jones & Stokes Associates file information (Table 10-2).

Species identified as having potential to occur at the site during the initial investigation were then targeted during field surveys, using the methods described below. Field surveys were conducted at the site throughout spring and summer 1993, during the

appropriate identification period for each species targeted. Vegetation surveys employed floristic methods, as advocated by DFG (1984) and Nelson (1987). Botanists identified all plant species encountered at the project site to the extent necessary to determine if the plant had any legal protective status. Such floristic survey methods helped ensure that special-status plant species were not inadvertently overlooked because they were not expected at the site.

In areas proposed for development, every vernal pool was surveyed to determine presence or absence of special-status plants in individual pools. Areas proposed as open space preserves were subsampled, with approximately every third vernal pool surveyed. Subsampling was undertaken to determine presence or absence of special-status plants in the proposed open space area but not to identify individual population occurrences. All habitats present at the site were investigated. All plant species observed were recorded, and a species list and description was prepared for each habitat encountered (Jones & Stokes Associates 1993a).

Additional detail on the methods and results of special-status species surveys and of wetland delineations and plant community evaluations are presented in Special-Status Plant and Wildlife Species Surveys and Habitat Assessments for the Rancho Seco Project Site (Jones & Stokes Associates 1993a) and Final Delineation of Waters of the United States, Including Wetlands, for the Rancho Seco Park Site (Jones & Stokes Associates 1993b), respectively.

## Results

A total of 13 special-status plant species have potential to be present at the project site. Of these species, three were located at the site during the field surveys: Boggs Lake hedge-hyssop, Greene's legenera and viscid orcutt grass.

**Boggs Lake Hedge-Hyssop.** One population of Boggs Lake hedge-hyssop was found in a vernal pool at the eastern edge of the project site. A total of six plants were found in the deepest portion of a vernal pool basin in an area with a relatively low vegetation cover (estimated at 25% absolute vegetation cover). Associated plant species observed include wire rush, downingia, whitehead navarretia, and smooth goldfields.

**Greene's Legenera.** In the same pool, approximately 125 Greene's legenera plants were also found. This plant species was found in the bottom of densely vegetated portions of the pool, associated mostly with wire rush and smooth goldfields. The dense vegetation mat provides shade or structural support for the species.

**Viscid Orcutt Grass.** One population of viscid orcutt grass with 250 plants was identified in a large vernal pool in the southeast portion of the project site, in an area proposed as open space. This population is suspected to be a known occurrence (Natural Diversity Data Base 1993). The population was found in a relatively shallow arm of Vernal

Table 10-2. Special-Status Plant Species with Potential to Occur on the Rancho Seco Project Site, Sacramento County

Species	Status <sup>a</sup>		Distribution	Habitat Association	Identification Period
	Federal/State/CNPS				
Hoover's spurge ( <i>Chamaesyce hooveri</i> )	P/--/1B		Central Valley from Tehama County south to Tulare County	Below high-water mark of large vernal pools	July-October
Dwarf downingia ( <i>Downingia humilis</i> )	C3c/--/1B		Infrequent in valley bottoms from Merced County north to Placer County, west to Sonoma County	Vernal pools in valley grasslands	March-May
Tuolumne coyote-thistle ( <i>Eryngium pinnatisectum</i> )	C2/--/1B		Central Valley from Amador, Calaveras, Tuolumne, and Sacramento Counties	Vernal pools and swales, seasonal wetlands	June-August
Boggs Lake hedge-hyssop ( <i>Gratiola heterosepala</i> )	C2/--/1B		From Oregon south to northern Sacramento Valley	Vernal pools and swales	April-June
California hibiscus ( <i>Hibiscus californicus</i> )	C2/--/1B		San Joaquin-Sacramento Delta, Butte sink, and creeks of Cascade foothills	Freshwater marsh	August-September
Ahart's rush ( <i>Juncus leiospermus</i> var. <i>ahartii</i> )	C2/--/1B		Central Valley from Butte County south to Calaveras County	Vernal pools in valley grasslands	April-May
Greene's legenere ( <i>Legenere limosa</i> )	C2/--/1B		Central Valley	Vernal pools in valley grasslands	May-June
Hairy orcutt grass ( <i>Orcuttia pilosa</i> )	P/E/1B		Eastern edge of the Central Valley from Tehama County to Madera County	Bottoms of large vernal pools	May-July
Slender orcutt grass ( <i>Orcuttia tenuis</i> )	P/E/1B		Eastern Siskiyou, Lake, Sacramento, and Shasta Counties	Bottoms of vernal pools underlain with volcanic substrates	May-June
Viscid orcutt grass ( <i>Orcuttia viscida</i> )	P/E/1B		Sacramento County	Bottoms of deep vernal pools with heavy clay soils	May-June
Hartweg's pseudobahia ( <i>Pseudobahia bahiifolia</i> )	1R/E/1B		Southern Central Valley	Valley foothill grasslands	March-May
Sanford's sagittaria ( <i>Sagittaria sanfordii</i> )	C2/--/3		Del Norte, Butte, Fresno, and Sacramento Counties	Freshwater marsh	May-June
Greene's tuctoria ( <i>Tuctoria greenei</i> )	C1/R/1B		Eastern edge of Central Valley from Tehama County to Tulare County	Bottoms of large vernal pools	May-July

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<sup>a</sup> Status explanations:

**Federal**

- C1 = Category 1 candidate for federal listing. Category 1 includes species for which USFWS has on file enough substantial information on biological vulnerability and threat to support proposals to list them.
- C2 = Category 2 candidate for federal listing. Category 2 includes species for which USFWS has some biological information indicating that listing may be appropriate but for which further biological research and field study are usually needed to clarify the most appropriate status. Category 2 species are not necessarily less rare, threatened, or endangered than Category 1 species or listed species; the distinction relates to the amount of data available and is therefore administrative, not biological.
- C3 = no longer a candidate for federal listing. Category 3 species have been dropped from the candidate list because they are extinct (C3a), taxonomically invalid or do not meet the USFWS definition of a "species" (C3b), or too widespread or not threatened at this time (C3c).
- 1R = recommended by USFWS for inclusion in the next update of the candidate species list (Category 1).
- P = under petition for federal listing by USFWS.

**State**

- E = listed as endangered under the California Endangered Species Act.
- R = listed as rare under the California Endangered Species Act. This category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.
- = no designation.

**California Native Plant Society**

- 1B = List 1b species: rare, threatened, or endangered in California and elsewhere.
- 3 = List 3 species: plants about which more information is needed to determine their status.
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Table 10-3. Special-Status Wildlife Species with Potential to Occur on the Rancho Seco Project Site, Sacramento County

Species	Status <sup>a</sup>		Distribution	Occurrence at the Rancho Seco Project Site
	Federal/State	Preferred Habitats		
<b>Invertebrates</b>				
Vernal pool fairy shrimp ( <i>Branchinecta lynchi</i> )	PE/-	Vernal pools	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County; isolated populations in Riverside County	Observed in vernal pools
California linderiella ( <i>Linderiella occidentalis</i> )	PE/-	Vernal pools	East side of Central Valley from Red Bluff to Madera County, across the Sacramento area, and through the central and south Coast Ranges from Lake County to Riverside County	Observed in vernal pools and one stock pond
Vernal pool tadpole shrimp ( <i>Lepidurus packardii</i> )	PE/-	Vernal pools	Observed from Shasta County to Merced County	Observed in vernal pools and one stock pond
<b>Amphibians</b>				
California tiger salamander ( <i>Ambystoma tigrinum californiense</i> )	C2 <sup>+</sup> /SSC	Vernal pools and ponds for breeding; ground squirrel and gopher burrows required in upland habitat for winter retreats	Butte County in the north to Santa Barbara County in the south	None observed; project site provides marginal habitat; very few ground squirrel burrows; ponds contain predatory fish; and most vernal pools do not hold water long enough for successful breeding
Western spadefoot toad ( <i>Scaphiopus hammondi</i> )	2R/SSC	Vernal pools for breeding and underground burrows for most of the year	Inhabits the Central Valley, adjacent foothills, and the Coast Ranges from Santa Barbara south to Mexican border	None observed during surveys; potential habitat occurs in vernal pools and adjacent uplands
<b>Reptiles</b>				
Western pond turtle ( <i>Clemmys marmorata</i> )	C1 <sup>+</sup> /SSC	Still waters such as ponds, reservoirs, and sluggish streams; breeds in upland habitat within 0.25 mile of water	Western Washington south to Baja California	None observed during field surveys; stock ponds and Rancho Seco Lake provide suitable habitat

Species	Status <sup>a</sup>		Preferred Habitats	Distribution	Occurrence at the Rancho Seco Project Site
	Federal/State				
<b>Birds</b>					
Swainson's hawk ( <i>Buteo swainsoni</i> )		-/T	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	Uses the lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley; most nesting occurs in Yolo County	None observed during field surveys; potential foraging habitat in grasslands
Black-shouldered kite ( <i>Elanus caeruleus</i> )		-/CP	Nests in riparian habitats, woodlands and isolated trees; forages in agricultural fields, grasslands, and wetlands	Open habitats throughout California, except deserts	Several observed during field surveys; in grasslands, which provide foraging habitat
Burrowing owl ( <i>Athene cunicularia</i> )		-/SSC	Nests in abandoned ground squirrel burrows in dry, flat grasslands, deserts, and agricultural areas	Permanent resident throughout California valleys and lowlands; summer range includes Siskiyou, Modoc, Lassen, Plumas, and Sierra Counties	None observed during field surveys; project site lacks ground squirrel burrows except in a few locations around rock outcrops and roads
Northern harrier ( <i>Circus cyaneus</i> )		-/SSC	Uses marshes, meadows, and seasonal and agricultural wetlands	Either a permanent or winter resident over all of California, except in the Klamath, Cascade, and Sierra Nevada ranges	Several observed during field surveys; in grasslands and wetlands, which provide foraging and nesting habitats
Cooper's hawk ( <i>Accipiter cooperii</i> )		-/SSC	Nests primarily in riparian forests dominated by deciduous species; also nests in densely canopied forests from digger pine-oak woodland up to ponderosa pine; forages in open woodlands	Found in all parts of California except high altitudes in the Sierra Nevada; winters in the Central Valley, southeastern desert regions, and plains east of the Cascade Range; permanent residents occupy the rest of the state	None observed during field surveys; riparian habitat provides potential nesting and foraging habitats
Ferruginous hawk ( <i>Buteo regalis</i> )		C2/SSC	Found in open terrain in plains and foothills where ground squirrels and other prey are available	Only winters in California; can be seen along the coast from Sonoma County to San Diego County, eastward to the Sierra Nevada foothills and southeastern deserts, the Inyo-White mountains, the plains east of the Cascade Range, and Siskiyou County	Potential winter visitor
Golden eagle ( <i>Aquila chrysaetos</i> )		-/SSC	Nests on cliffs, escarpments, or large oaks; forages over annual grasslands	Permanent resident over most of California; occurs in the Sierra Nevada and Coast Ranges in the summer and the Central Valley in winter	Potential winter visitor

Species	Status <sup>a</sup>		Distribution	Occurrence at the Rancho Seco Project Site
	Federal/State	Preferred Habitats		
Sharp-shinned hawk ( <i>Accipiter striatus</i> )	-/SSC	Uses dense canopy ponderosa pine or mixed conifer forest as well as riparian habitats	Permanent resident in the Sierra Nevada, and Cascade, Klamath, and north Coast Ranges at midelevations, as well as along the coast in Marin, San Francisco, San Mateo, Santa Cruz, and Monterey Counties; winters over the rest of the state except in very high elevations	Potential winter visitor
Merlin ( <i>Falco columbarius</i> )	-/SSC	Open grasslands and farmland with scattered trees	Only winters in California; occurs throughout California but concentrated along the coast and in the Central Valley	Potential winter visitor
Prairie falcon ( <i>Falco mexicanus</i> )	-/SSC	Nests on cliffs or escarpments adjacent to dry, open terrain; uplands, marshes, or seasonal agricultural wetlands	Permanent resident on the south Coast, Transverse, Peninsular, and northern Cascade Ranges; the southeastern deserts; Inyo-White mountains; Modoc, Lassen, and Plumas Counties; and the foothills surrounding the Central Valley; winters in the Central Valley, along the coast from Santa Barbara County to San Diego County and in Marin, Sonoma, Humboldt, Del Norte, and Inyo Counties	Potential winter visitor
Short-eared owl ( <i>Asio flammeus</i> )	-/SSC	Uses freshwater and saltwater marshes, lowland meadows, and irrigated alfalfa fields; needs dense tules or tall grass for nesting and daytime roosts	Permanent resident along the coast from Del Norte County to Monterey County, in the Sierra Nevada north of Nevada County, the plains east of the Cascades Ranges, and Mono County; winters on the coast from San Luis Obispo County to San Diego County, in the Central Valley from Tehama County to Kern County, in the eastern Sierra Nevada from Sierra County to Alpine County, the Channel Islands, and Imperial County; small isolated populations also nest in the Central Valley	Potential rare visitor

Species	Status <sup>a</sup>		Preferred Habitats	Distribution	Occurrence at the Rancho Seco Project Site
	Federal/State				
Yellow warbler ( <i>Dendroica petechia</i> )	-/SSC		Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders; may also use oaks, conifers, and urban areas in or near streamcourses	Nests over all of California except the Central Valley, the Mohave Desert region, and high altitudes in the Sierra Nevada; winters along the Colorado River and in parts of Imperial and Riverside Counties; two small permanent populations are in San Diego and Santa Barbara Counties	None observed during field surveys; riparian habitat provides potential nesting habitat
Tricolored blackbird ( <i>Agelaius tricolor</i> )	C2/SSC		Nests in freshwater marshes with heavy growths of cattails and tules; other forms of dense vegetation, including blackberry thickets, may also be used for nesting; nesting areas must be large enough to support a colony of at least 50 pairs; birds forage in grasslands and fields surrounding the colony	Permanent residents in the Central Valley from Butte County through Kern County, on the south Coast and Peninsular Ranges, and in parts of San Diego, Los Angeles, Alameda, Sonoma, and Lake Counties; breeding colonies are in Siskiyou, Modoc, and Lassen Counties; around the San Francisco Bay from Marin County to Santa Cruz County, and east through the Delta to Solano County	Observed a flock of 150 tricolored blackbirds during field surveys; project site grasslands provide foraging habitat; no suitable nesting habitat present at project site
<b>Mammals</b>					
American badger ( <i>Taxidea taxus</i> )	-/SSC		Occurs in a variety of habitats, including grasslands and oak woodlands with friable soils for digging	Uncommon, permanent resident found throughout much of the state; several records for Placer County	None observed during field surveys; suitable habitat limited by lack of friable soils and limited prey

<sup>a</sup> Status explanations

**Federal**

E = listed as endangered under the federal Endangered Species Act.

T = listed as threatened under the federal Endangered Species Act.

PE = proposed for federal listing as endangered under the federal Endangered Species Act.

C1 = Category 1 candidate for federal listing. Category 1 includes species for which USFWS has on file enough substantial information on biological vulnerability and threat to support proposals to list them.

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**C2** = Category 2 candidate for federal listing. Category 2 includes species for which USFWS has some biological information indicating that listing may be appropriate but for which further biological research and field study are usually needed to clarify the most appropriate status. Category 2 species are not necessarily less rare, threatened, or endangered than Category 1 species or listed species; the distinction relates to the amount of data available and is therefore administrative, not biological.

**2R** = recommended by USFWS for inclusion in the next update of the candidate species list (Category 2).

**+** = under petition to be considered for federal listing as threatened or endangered.

**--** = no designation.

**State**

**CP** = fully protected under the California Fish and Game Code.

**T** = listed as threatened under the California Endangered Species Act.

**SSC** = species of special concern.

**--** = no designation.

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Pool 44, where the pool supports a relatively sparse vegetative cover of woolly marbles, whitehead navarretia, and downingia.

## Special-Status Wildlife Species

### Methodology

To determine the presence of special-status wildlife species and suitable habitat for wildlife species, biologists first compiled a list of species known from the region and from the habitat types present at the site (Table 10-3). Sources consulted during preparation of the wildlife species list include Taylor (1983), Remsen (1978), Williams (1986), knowledgeable individuals (White, Brewer, and Brode pers. comms.), and Jones & Stokes Associates file information. Species identified during the initial investigation were then targeted during field surveys. Field surveys were conducted at the site throughout spring and summer 1993, during the appropriate identification period for each species targeted. Habitat suitability was also assessed for wildlife species that are expected to use the site for foraging or nesting during a portion of the year.

Wildlife biologists walked the entire project site, using zig-zag transects to sample all habitats present. All wildlife species and signs of wildlife use observed during the field survey were recorded and mapped. Areas proposed as open space preserves were subsampled; all vernal pools encountered that were considered suitable for special-status wildlife species were surveyed. In addition, approximately every third vernal pool in areas proposed for open space were randomly surveyed. Additional survey methodology is described in the following sections.

**Shrimp and Amphibian Survey Methods.** Field surveys were conducted on February 8, 9, 10, and 19; March 5 and 19; April 3; and May 19, 20, and 21, 1993. Sample timing was based on shrimp and amphibian life cycles. Each water body that could potentially support shrimp or amphibian species was sampled a minimum of three times at approximately 2-week intervals.

Water bodies were quietly approached and visually searched for shrimp and amphibians. Visible shrimp and amphibians were immediately netted with either a 12-inch-diameter or a 5-inch-diameter net, both of which have 173 threads per inch (80- $\mu$ m aperture). Pools were then systematically sampled with dip nets using the following procedure: nets were pulled from shore to shore and at a minimum of three locations along the perimeter of the water body. Occasional variations of this procedure were used if initial attempts failed to capture shrimp or amphibians.

The contents of each dip net sample were observed for shrimp or amphibian larvae. Amphibian larvae were quickly identified to species, then returned immediately to the same water body from which they were captured. Shrimp were initially identified to species in

Table 10-3. Special-Status Wildlife Species with Potential to Occur on the Rancho Seco Project Site, Sacramento County

Species	Status <sup>a</sup>		Distribution	Occurrence at the Rancho Seco Project Site
	Federal/State	Preferred Habitats		
<b>Invertebrates</b>				
Vernal pool fairy shrimp ( <i>Branchinecta lynchi</i> )	PE/--	Vernal pools	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County; isolated populations in Riverside County	Observed in vernal pools
California linderiella ( <i>Linderiella occidentalis</i> )	PE/--	Vernal pools	East side of Central Valley from Red Bluff to Madera County, across the Sacramento area, and through the central and south Coast Ranges from Lake County to Riverside County	Observed in vernal pools and one stock pond
Vernal pool tadpole shrimp ( <i>Lepidurus packardii</i> )	PE/--	Vernal pools	Observed from Shasta County to Merced County	Observed in vernal pools and one stock pond
<b>Amphibians</b>				
California tiger salamander ( <i>Ambystoma tigrinum californiense</i> )	C2 <sup>+</sup> /SSC	Vernal pools and ponds for breeding; ground squirrel and gopher burrows required in upland habitat for winter retreats	Butte County in the north to Santa Barbara County in the south	None observed; project site provides marginal habitat; very few ground squirrel burrows; ponds contain predatory fish; and most vernal pools do not hold water long enough for successful breeding
Western spadefoot toad ( <i>Scaphiopus hammondi</i> )	2R/SSC	Vernal pools for breeding and underground burrows for most of the year	Inhabits the Central Valley, adjacent foothills, and the Coast Ranges from Santa Barbara south to Mexican border	None observed during surveys; potential habitat occurs in vernal pools and adjacent uplands
<b>Reptiles</b>				
Western pond turtle ( <i>Clemmys marmorata</i> )	C1 <sup>+</sup> /SSC	Still waters such as ponds, reservoirs, and sluggish streams; breeds in upland habitat within 0.25 mile of water	Western Washington south to Baja California	None observed during field surveys; stock ponds and Rancho Seco Lake provide suitable habitat

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Species	Status <sup>a</sup>		Preferred Habitats	Distribution	Occurrence at the Rancho Seco Project Site
	Federal/State				
<b>Birds</b>					
Swainson's hawk ( <i>Buteo swainsoni</i> )	--/T		Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	Uses the lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley; most nesting occurs in Yolo County	None observed during field surveys; potential foraging habitat in grasslands
Black-shouldered kite ( <i>Elanus caeruleus</i> )	--/CP		Nests in riparian habitats, woodlands and isolated trees; forages in agricultural fields, grasslands, and wetlands	Open habitats throughout California, except deserts	Several observed during field surveys; in grasslands, which provide foraging habitat
Burrowing owl ( <i>Athene cunicularia</i> )	--/SSC		Nests in abandoned ground squirrel burrows in dry, flat grasslands, deserts, and agricultural areas	Permanent resident throughout California valleys and lowlands; summer range includes Siskiyou, Modoc, Lassen, Plumas, and Sierra Counties	None observed during field surveys; project site lacks ground squirrel burrows except in a few locations around rock outcrops and roads
Northern harrier ( <i>Circus cyaneus</i> )	--/SSC		Uses marshes, meadows, and seasonal and agricultural wetlands	Either a permanent or winter resident over all of California, except in the Klamath, Cascade, and Sierra Nevada ranges	Several observed during field surveys; in grasslands and wetlands, which provide foraging and nesting habitats
Cooper's hawk ( <i>Accipiter cooperii</i> )	--/SSC		Nests primarily in riparian forests dominated by deciduous species; also nests in densely canopied forests from digger pine-oak woodland up to ponderosa pine; forages in open woodlands	Found in all parts of California except high altitudes in the Sierra Nevada; winters in the Central Valley, southeastern desert regions, and plains east of the Cascade Range; permanent residents occupy the rest of the state	None observed during field surveys; riparian habitat provides potential nesting and foraging habitats
Ferruginous hawk ( <i>Buteo regalis</i> )	C2/SSC		Found in open terrain in plains and foothills where ground squirrels and other prey are available	Only winters in California; can be seen along the coast from Sonoma County to San Diego County, eastward to the Sierra Nevada foothills and southeastern deserts, the Inyo-White mountains, the plains east of the Cascade Range, and Siskiyou County	Potential winter visitor
Golden eagle ( <i>Aquila chrysaetos</i> )	--/SSC		Nests on cliffs, escarpments, or large oaks; forages over annual grasslands	Permanent resident over most of California; occurs in the Sierra Nevada and Coast Ranges in the summer and the Central Valley in winter	Potential winter visitor

Species	Status <sup>a</sup>		Preferred Habitats	Distribution	Occurrence at the Rancho Seco Project Site
	Federal/State				
Sharp-shinned hawk ( <i>Accipiter striatus</i> )	--/SSC		Uses dense canopy ponderosa pine or mixed conifer forest as well as riparian habitats	Permanent resident in the Sierra Nevada, and Cascade, Klamath, and north Coast Ranges at midelevations, as well as along the coast in Marin, San Francisco, San Mateo, Santa Cruz, and Monterey Counties; winters over the rest of the state except in very high elevations	Potential winter visitor
Merlin ( <i>Falco columbarius</i> )	--/SSC		Open grasslands and farmland with scattered trees	Only winters in California; occurs throughout California but concentrated along the coast and in the Central Valley	Potential winter visitor
Prairie falcon ( <i>Falco mexicanus</i> )	--/SSC		Nests on cliffs or escarpments adjacent to dry, open terrain; uplands, marshes, or seasonal agricultural wetlands	Permanent resident on the south Coast, Transverse, Peninsular, and northern Cascade Ranges; the southeastern deserts; Inyo-White mountains; Modoc, Lassen, and Plumas Counties; and the foothills surrounding the Central Valley; winters in the Central Valley, along the coast from Santa Barbara County to San Diego County and in Marin, Sonoma, Humboldt, Del Norte, and Inyo Counties	Potential winter visitor
Short-eared owl ( <i>Asio flammeus</i> )	--/SSC		Uses freshwater and saltwater marshes, lowland meadows, and irrigated alfalfa fields; needs dense tules or tall grass for nesting and daytime roosts	Permanent resident along the coast from Del Norte County to Monterey County, in the Sierra Nevada north of Nevada County, the plains east of the Cascades Ranges, and Mono County; winters on the coast from San Luis Obispo County to San Diego County, in the Central Valley from Tehama County to Kern County, in the eastern Sierra Nevada from Sierra County to Alpine County, the Channel Islands, and Imperial County; small isolated populations also nest in the Central Valley	Potential rare visitor

Species	Status <sup>a</sup>		Preferred Habitats	Distribution	Occurrence at the Rancho Seco Project Site
	Federal/State				
Yellow warbler ( <i>Dendroica petechia</i> )	-/SSC		Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders; may also use oaks, conifers, and urban areas in or near streamcourses	Nests over all of California except the Central Valley, the Mohave Desert region, and high altitudes in the Sierra Nevada; winters along the Colorado River and in parts of Imperial and Riverside Counties; two small permanent populations are in San Diego and Santa Barbara Counties	None observed during field surveys; riparian habitat provides potential nesting habitat
Tricolored blackbird ( <i>Agelaius tricolor</i> )	C2/SSC		Nests in freshwater marshes with heavy growths of cattails and tules; other forms of dense vegetation, including blackberry thickets, may also be used for nesting; nesting areas must be large enough to support a colony of at least 50 pairs; birds forage in grasslands and fields surrounding the colony	Permanent residents in the Central Valley from Butte County through Kern County, on the south Coast and Peninsular Ranges, and in parts of San Diego, Los Angeles, Alameda, Sonoma, and Lake Counties; breeding colonies are in Siskiyou, Modoc, and Lassen Counties; around the San Francisco Bay from Marin County to Santa Cruz County, and east through the Delta to Solano County	Observed a flock of 150 tricolored blackbirds during field surveys; project site grasslands provide foraging habitat; no suitable nesting habitat present at project site
<b>Mammals</b>					
American badger ( <i>Taxidea taxus</i> )	-/SSC		Occurs in a variety of habitats, including grasslands and oak woodlands with friable soils for digging	Uncommon, permanent resident found throughout much of the state; several records for Placer County	None observed during field surveys; suitable habitat limited by lack of friable soils and limited prey

<sup>a</sup> Status explanations**Federal**

E = listed as endangered under the federal Endangered Species Act.

T = listed as threatened under the federal Endangered Species Act.

PE = proposed for federal listing as endangered under the federal Endangered Species Act.

C1 = Category 1 candidate for federal listing. Category 1 includes species for which USFWS has on file enough substantial information on biological vulnerability and threat to support proposals to list them.

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**C2** = Category 2 candidate for federal listing. Category 2 includes species for which USFWS has some biological information indicating that listing may be appropriate but for which further biological research and field study are usually needed to clarify the most appropriate status. Category 2 species are not necessarily less rare, threatened, or endangered than Category 1 species or listed species; the distinction relates to the amount of data available and is therefore administrative, not biological.

**2R** = recommended by USFWS for inclusion in the next update of the candidate species list (Category 2).

**+** = under petition to be considered for federal listing as threatened or endangered.

**-** = no designation.

**State**

**CP** = fully protected under the California Fish and Game Code.

**T** = listed as threatened under the California Endangered Species Act.

**SSC** = species of special concern.

**-** = no designation.

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the field with the aid of a 15-x hand lens. A representative sample of each shrimp species was placed into a sample container filled with 70% ethanol. Each sample container was marked with the species name, sample site number, and date. All sample containers were transported to Jones & Stokes Associates' laboratory for further analysis of shrimp specimens. Specimens were viewed under an Olympus SZ40 10- to 160-x zoom stereoscope to verify identification of species made in the field using current taxonomic keys (Eng et al. 1990, Belk 1975, and Pennak 1978) and by comparison with voucher specimens in the Jones & Stokes Associates' collection. Specimens were stored in containers labeled with the collection date, location, sample pool number, species, order, name of the person who did the collecting, and name of the person who identified the collection.

**Other Wildlife Survey Methods.** Surveys for other wildlife species (e.g., raptors, other bird species, reptiles, and badgers) were conducted on April 3 (concurrent with shrimp surveys) and on May 19, 20, and 21, 1993. The site was systematically walked, using zig-zag transects. All indications of wildlife use, including locations of dens and burrows, were noted and mapped.

## Results

A total of 20 wildlife species were identified during the initial investigation as having potential to occur at the site. Of these species, five special-status wildlife species were located during field surveys; an additional 15 wildlife species have suitable foraging or nesting habitat at the project site.

**Shrimp Species.** Three species of special-status shrimp were located in vernal pools on the site: vernal pool fairy shrimp (*Branchinecta lynchi*), California linderiella (*Linderiella occidentalis*), and vernal pool tadpole shrimp (*Lepidurus packardii*). These species are currently proposed for listing by USFWS as endangered under the federal Endangered Species Act and could be listed within the life span of the project.

These species were typically found in vernal pools where maximum ponding reached or exceeded 4 inches. Most of the vernal pools located in proposed development areas are relatively shallow (less than 4 inches deep) and contained comparatively fewer populations of shrimp. In general, the largest concentrations of shrimp were observed in the larger, deeper vernal pools in proposed open space areas of the project site.

**Western Pond Turtle.** The western pond turtle is a state species of special concern and is the subject of a petition for listing as endangered under the federal Endangered Species Act, and could be listed within the life span of the project. Western pond turtle is currently divided into two subspecies: the northwestern pond turtle and the southwestern pond turtle. The project site is in an area of intergrade between the two subspecies. The U.S. Fish and Wildlife Service (USFWS) is currently considering new information on the taxonomic status of the species and may decide not to recognize these two subspecies (Brewer pers. comm.). Western pond turtle has the potential to occur on the project site.

Western pond turtles prefer the quiet waters of ponds, reservoirs, and sluggish streams (Stebbins 1985). Terrestrial habitat is required for breeding, and pond turtles may travel up to 0.25-0.5 mile upslope from a permanent water source to lay eggs in terrestrial habitat (Brewer and Brode pers. comms.).

Although no western pond turtles were observed, suitable aquatic habitat occurs in the stock ponds and in Rancho Seco Lake, and suitable adjacent nesting habitat is present on annual grassland of the project site.

**California Tiger Salamander.** The California tiger salamander is the subject of a petition for listing as endangered under the federal Endangered Species Act and could be listed within the life span of the project. Adult California tiger salamanders are terrestrial and spend most of the year in underground burrows (typically California ground squirrel burrows), emerging for only brief periods to breed (Stebbins 1985). Breeding occurs in temporary and permanent waters in grassland and open woodland habitats (Stebbins 1985). Individuals may travel as far as 1 mile to breeding sites during the first heavy rains, mainly from December to February. The range of the tiger salamander has been reduced in much of the Central Valley because of conversion of grasslands to agricultural and urban uses. (Stebbins 1985, Brode pers. comm.)

Suitable breeding and overwintering habitat is present in grasslands, stock ponds, and vernal pools on the project site; however, no California tiger salamanders were found on the project site. The low number of California ground squirrel burrows, which are used by the species for estivation, reduces the potential for occurrence on the site. However, NDDDB (1993) records indicate historical occurrences of California tiger salamanders approximately 2 miles west of the project site.

**Western Spadefoot Toad.** The western spadefoot toad is a state species of special concern and a candidate (Category 2) for listing under the federal Endangered Species Act. Western spadefoot toads are in California's Central Valley from Shasta County to northern Baja California. Western spadefoot toad is primarily a lowland species, frequenting washes and floodplains of rivers but ranging into the foothills and mountain valleys (Stebbins 1985). Western spadefoot toads prefer areas of open vegetation and short grass, where the soil is sandy and gravelly (Stebbins 1985). Spadefoot toads survive dry periods by inhabiting gopher burrows, ground squirrel holes, or self-made burrows. With winter rains, adults become active when they migrate to water bodies. Spadefoot toads breed in pools that form after heavy rains, in slow streams, or in reservoirs. The period from egg laying until tadpoles metamorphose into adults lasts approximately 1 month, this rapid development being an excellent adaptation to life in vernal pools (Stebbins and Major 1965).

Although the seasonal wetlands on the project site provide suitable habitat for western spadefoot toads, no spadefoot toads were found during Jones & Stokes Associates surveys.

**Swainson's Hawk.** The Swainson's hawk is a state-listed threatened species. The species historically nested in woodland habitat and foraged in native grassland habitat of the Central Valley. Loss of these habitats is attributable to conversion of native grassland and woodland habitats to agricultural uses. This conversion has contributed to the estimated 90% decline in the statewide population of Swainson's hawk (Bloom 1980). Currently, Swainson's hawks in the Central Valley forage in large, open agricultural habitat compatible with their foraging needs and nest primarily in remnant riparian woodlands. Loss and fragmentation of native grassland and woodland habitats are resulting in further losses of historical nesting and foraging territories. (Estep 1989.)

No Swainson's hawks were observed during field surveys. However, the annual grasslands within the project site offer moderate-quality foraging habitat, and an active nest is known within 10 miles of the project area, along Dry Creek (Jones & Stokes Associates 1990). DFG considers all suitable lands within a 10-mile radius of an active Swainson's hawk nest to be foraging habitat.

**Black-Shouldered Kite.** The black-shouldered kite is a fully protected species. Black-shouldered kites are found primarily in open agricultural or grassland habitats. This species declined noticeably during the early part of this century (Grinnell and Miller 1944) but is now fairly common, particularly in the Central Valley.

Several black-shouldered kites were observed on the project site during field surveys. The annual grasslands provide foraging habitat and, although no nests were found, the riparian woodland surrounding Rancho Seco Lake could provide adequate nest habitat for the black-shouldered kite.

**Northern Harrier.** The northern harrier is a species of special concern to DFG. The northern harrier nests in marshes, meadows, and undisturbed grasslands in the Central Valley throughout California (Remsen 1978).

Several northern harriers were observed on the project site during field surveys. No nests were located and suitable nesting habitat is limited to areas of dense herbaceous vegetation on the project site.

**Cooper's Hawk.** The Cooper's hawk is a third-priority species of special concern to DFG. This designation indicates that the species is not in any present danger of extirpation in California but populations are small and vulnerable to extirpation should threats increase (Remsen 1978). Cooper's hawks historically nested in lowland riparian woodlands throughout the Central Valley. Pesticide contamination and loss of Central Valley riparian habitat have restricted the breeding populations to foothill and midelevation oak and montane hardwood forests.

No Cooper's hawks were observed during field surveys. Current records reveal that few Cooper's hawks nest in Central Valley riparian habitat, and the occurrence of the

species at the project site as a breeding bird is unlikely because of the lack of dense canopy trees.

**Sharp-Shinned Hawk.** The sharp-shinned hawk is a third-priority species of special concern to DFG. This species does not breed in the Central Valley and is an uncommon breeding bird throughout the state (Remsen 1978). However, this species does winter in the Central Valley.

Although no sharp-shinned hawks were observed during field surveys, the riparian habitat on the project site is considered suitable winter roosting and foraging habitat.

**Golden Eagle.** The golden eagle is a species of special concern to DFG. The golden eagle is a resident species throughout California and nests in cliffs or trees on the slopes of hills, preferably overlooking grasslands. Eagles forage in unfragmented grasslands and oak savannas. The golden eagle is a species of special concern because of habitat loss, persecution by humans, and declines in abundance of the prey species.

No golden eagles or their nests were observed during field surveys. Although the annual grasslands may provide moderate-quality foraging habitat, the project site is considered low-quality nesting habitat for golden eagles because no cliffs or suitable trees on hillsides are present.

**Ferruginous Hawk.** The ferruginous hawk is a state species of special concern and a Category 1 candidate for federal listing. The ferruginous hawk winters in the Central Valley and the foothills of the Sierra Nevada and Coast Ranges. Ferruginous hawks forage in open grasslands with perch sites (e.g., mature trees and utility poles).

No ferruginous hawks were observed during surveys; however, suitable foraging habitat is present on the site and may attract wintering birds.

**Prairie Falcon.** The prairie falcon is a species of special concern to DFG. Prairie falcons occur throughout California, nesting on cliff ledges and foraging in open habitats, including grasslands, open brushlands, and rocky areas. No prairie falcons were observed during surveys, although the annual grasslands on the project site are suitable for foraging. However, the project site is unsuitable breeding habitat for prairie falcons because it lacks suitable cliffs for nesting.

**Merlin.** The merlin is a first-priority species of special concern to DFG. This designation indicates that the species faces immediate extirpation of its entire California population or its California breeding population if current trends continue. The merlin does not breed in California, although it is present throughout the Central Valley during winter.

Although no merlins were observed during field surveys, the riparian habitat on the project site is considered suitable winter roosting habitat, and surrounding annual grasslands are considered suitable foraging habitat.

**Burrowing Owl.** The burrowing owl is designated by DFG as a state species of special concern. The conversion of annual grasslands to agricultural and urban uses have contributed to its decline in the Central Valley. Burrowing owls typically nest and winter in burrows excavated by California ground squirrels. Burrowing owls continue to occupy nesting burrows year round. They forage in the short grassland or agricultural habitats.

No burrowing owls or evidence of burrowing owl presence were observed on the project site. An active ground squirrel colony is located below the dam face; however, very few ground squirrels and burrows are present outside this area. Field survey results and the limited amount of burrowing habitat on the site indicate that the presence of burrowing owls is unlikely.

Although burrowing owls were not observed in the project area during the Jones & Stokes Associates surveys, several burrowing owls have been observed by SMUD personnel just north of the project site (Palmquist pers. comm.).

**Short-Eared Owl.** The short-eared owl is designated by DFG as a state species of special concern. This owl forages in freshwater and saltwater marshes, lowland meadows, and irrigated alfalfa fields and nests and roosts in dense tules or tall grasses. Although the short-eared owl is mostly a coastal species, small isolated breeding populations also occur in the Central Valley.

No short-eared owls were observed at the project site and none are expected because of the lack of dense cover for nesting and the limited availability of suitable foraging habitat.

**Other Raptors.** Two types of common raptors, the red-tailed hawk and great horned owl, were found nesting just outside the project site. Although these species have no state or federal legal status, raptor nests are protected by state law (California Fish and Game Code, Section 3503.5).

**Yellow warbler.** The yellow warbler is a second-priority species of special concern in California. Once abundant in riparian habitats throughout California, this species is now uncommon in the Central Valley. The yellow warbler has declined as a breeding bird because of the destruction of riparian habitats and nest parasitism by brown-headed cowbirds (Remsen 1978). The southern portion of the Sacramento Valley is no longer considered to be within the breeding range of the yellow warbler; however, the species may be observed in the Central Valley during migration.

No yellow warblers were observed during field surveys, but the species could use the riparian woodland along Rancho Seco Lake during migration.

**Tricolored Blackbird.** The tricolored blackbird is a candidate (Category 2) for listing under the federal Endangered Species Act and is designated as a state species of special concern by DFG.

Tricolored blackbird populations have declined significantly in this century, dropping 90% from the 1930s to the 1980s. Colonies have also declined in size and have been replaced by smaller, fragmented colonies. The sizes of the largest colonies reported in the 1970s and 1980s averaged 10% of the adults contained in the largest colonies observed in the 1930s. The loss of wetland habitats, disturbance by humans near nesting colonies, and poisoning may be the primary reasons for the population decline (Beedy et al. 1991).

The tricolored blackbird's breeding range includes lowlands and valleys throughout California. This blackbird breeds in freshwater marshes and blackberry thickets and forages in wetlands, grasslands, agricultural fields, and pastures. Proximity to concentrated insect food supplies is probably the major factor in the tricolored blackbird's selection of nesting sites (Neff 1937, Payne 1969, Beedy et al. 1991). Tricolored blackbirds exploit locally abundant food sources and minimize the distance of their foraging flights (Crane and DeHaven 1977), although they are known to forage up to 4 miles from the nesting colony to consume large concentrations of grasshoppers (Orians 1961). The lack of concentrated insect sources near suitable nesting sites could account for many observed tricolored blackbird nesting failures (Beedy et al. 1991).

Numerous tricolored blackbirds were observed foraging throughout the grasslands on the project site but the blackbirds were present in higher numbers (approximately 200) near the lake. Although no nesting was observed, the marshes around stock ponds and on the edges of Rancho Seco Lake are considered suitable breeding sites for the tricolored blackbird. Human activities, however, would preclude blackbirds from nesting in areas adjacent to Rancho Seco Lake. The annual grasslands, irrigated pastures, and lawns on the project site are considered high-quality foraging habitat for these blackbirds.

**American Badger.** The American badger is a state species of special concern. Badgers in California occupy a variety of habitats, including grasslands and savannas. The species' principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground. American badgers occur from northern Alberta southward to central Mexico. Historically in California, badgers ranged throughout the state except in the humid coastal forests. Badgers were numerous in the Central Valley but now survive only in low numbers in peripheral parts of the valley and adjacent lowlands to the west in eastern Monterey, San Benito, and San Luis Obispo Counties. (Williams 1986.) Badger populations have declined drastically in California within the last century (Grinnell et al. 1937). Agricultural and urban development has been the primary cause of the decline and extirpation of populations of badgers in California (Williams 1986).

American badgers have not been observed on the project site and are not expected to occur because few ground-dwelling rodents, which are the main food source for the species, are present. The site also lacks suitable friable soils favored by this species.

## IMPACTS

### Criteria for Determining Significance

According to the State CEQA Guidelines, a project will normally have a significant effect on the environment if it will:

- substantially affect a rare or endangered species of animal or plant or the habitat of the species or
- substantially diminish habitat for fish, wildlife, or plants.

Species that meet CEQA criteria for rare or endangered status must be considered even if they are not on an official government list (State CEQA Guidelines). Impacts on federal candidate species (Category 1 or 2), California species of special concern, or CNPS List 1B or 2 species are considered significant if the following substantially affect portions of local or regional populations:

- direct mortality;
- permanent loss of existing habitat (i.e., breeding, foraging, nesting);
- temporary loss of habitat that may result in increased mortality or lower reproductive success; or
- avoidance by wildlife of biologically important habitat for substantial periods, which may increase mortality or lower reproductive success.

### Impact Analysis

The Rancho Seco Park master plan includes a conceptual wetland mitigation plan as part of the project description. The conceptual mitigation plan addresses impacts on wetland communities that are considered jurisdictional pursuant to Section 404 of the Clean Water Act, including wetland habitats that support special-status shrimp species. In summary, the conceptual mitigation plan compensates for the loss of 4.28 acres of wetland habitats through creation of 6.90 acres of wetland habitats, and provides for the protection of the remaining 195.15 acres of wetland habitats at the site from future development.

Ten vernal pools that support special-status shrimp would be adversely affected by the project. Loss of the 10 vernal pools that support special-status shrimp would be compensated for by inoculating 10 created vernal pool habitats with soil containing shrimp

eggs collected from the affected pools. The goal of shrimp mitigation is to achieve no net loss of shrimp populations.

The wetland mitigation emphasizes creation of wetland habitats on lands that were modified for agricultural or industrial purposes but that likely supported wetland habitats in the past. Wetland creation sites are located near, but not within, existing wetland habitats to avoid disrupting the ecology or hydrological functioning of existing habitats and to facilitate natural establishment of similar plant, invertebrate, and wildlife species.

### **Wetland Communities**

The wetland mitigation plan is included in the Predischarge Notification (PDN) for the Proposed Rancho Seco Park Master Plan Project as submitted to the Corps on October 28, 1993. Copies of the PDN are available from SMUD. The Corps has authorized the project under Nationwide Permit Number 26, provided that SMUD complies with the special conditions of the permit. A copy of the letter of authorization is included as Appendix C.

**Impact Summary.** Implementation of the project would result in the loss of 4.28 acres of wetland habitats, creation of 6.90 acres of wetland habitats, and protection of the remaining 195.15 acres of wetland habitats at the site. This impact is considered significant. To reduce this impact to a less-than-significant level, implement the following mitigation measures:

- 10.1 Implement the conceptual wetland mitigation and monitoring plan for the project.
- 10.2 Obtain a streambed alteration agreement from DFG.

### **Nonwetland Communities**

**Annual Grassland.** Approval of the project would result in the conversion of approximately 200 acres of annual grassland to recreational facilities. However, approximately 84 acres of annual grassland would be restored as part of the conceptual wetland mitigation plan. Restoration of a grassland-vernal pool habitat complex would be conducted as part of recontouring and reseeded of the wetland mitigation sites, as described in the conceptual wetland mitigation plan. Implementation of the concept plan is expected to increase the species diversity of the existing annual grassland in this area, thereby improving habitat quality for dependent wildlife species and offsetting some of the habitat values lost from facility construction.

The annual grassland converted by the project represents a fraction of a percent of the annual grassland present at the site and in the surrounding region and is not expected

to substantially reduce the amount of foraging habitat available for raptors and other special-status wildlife species. Some additional annual grassland could be temporarily disturbed in areas outside facility locations identified in the park master plan through stockpiling of materials in staging areas or construction of temporary access roads. Although the amount of annual grassland temporarily disturbed by construction activities cannot be determined, it is expected to be minimal because construction staging areas are likely to be located in previously developed areas such as parking lots, and site access is expected to primarily consist of existing roads.

**Impact Summary.** Implementation of the project would result in the conversion of approximately 200 acres of annual grassland to recreation facilities. This impact is considered less than significant because the annual grasslands at the site do not support unique botanical resources and the proposed mitigation for wetlands would also result in restoration of approximately 84 acres of annual grassland located in a previously irrigated pasture. No mitigation is recommended.

#### **Irrigated Pasture**

**Impact Summary.** Implementation of the proposed project, specifically the conceptual wetland mitigation plan, would result in the conversion of previously irrigated pasture that supports Mediterranean barley to wetland and annual grassland habitats. This impact is considered beneficial because conversion of irrigated pasture to a more diverse mixture of annual grassland species increases habitat values for dependent wildlife species. No mitigation is recommended.

**Ornamental Plantings.** Approval of the project is expected to increase ornamental plantings at the site. Ornamental plantings associated with the golf course will emphasize use of native oak species (including coast live oak, valley oak, black oak, blue oak, and interior live oak); evergreens (coast live oak and holly oak); and non-native, compatible ornamental trees. Increasing tree number and density at the site is expected to improve nesting habitat and foraging habitat (by providing perches) for raptor species. From a botanical perspective, introduction of species native to California, but not necessarily known historically from the project site, is considered neither a beneficial nor an adverse impact because introduction of such species does not improve the existing botanical attributes or substantially decrease suitable habitat for dependent plant or wildlife species.

**Impact Summary.** Implementation of the project would result in an increase in ornamental plantings at the site. This impact is considered less than significant. No mitigation is recommended.

#### **Special-Status Plant Species**

Impacts on special-status plants are not expected to result from project implementation because plant populations are located in proposed open space areas on the

eastern half of the project site where no development is proposed and human access will be restricted. Impacts on these species from subsequent use of the recreation facilities, especially the golf course, is considered unlikely because the plants are located in vernal pools from over a quarter of a mile to over 1 mile away from recreation facilities and are separated from recreation facilities by Rancho Seco Lake. Subsequent human access to the vernal pools that support special-status plant species is expected to be restricted by SMUD as a condition of the Section 404 permit authorization.

**Impact Summary.** Implementation of the project would result in no impacts on special-status plant species because the special-status plant populations will be protected in the open space areas as a condition of the Section 404 permit authorization. No mitigation is recommended.

### **Common Wildlife Species**

**Impact Summary.** Implementation of the project would result in short-term disturbance to common wildlife species during construction. This impact is considered less than significant because its effects are temporary and the species affected are locally and regionally abundant. No mitigation is recommended.

### **Special-Status Wildlife Species**

Implementation of the project would result in no impacts on western pond turtle, American badger, and western spadefoot toad; no mitigation is recommended.

The following section describes short-term impacts on special-status wildlife species, including shrimp, amphibians, Swainson's hawk and other raptors, and tricolored blackbird.

**Shrimp Species.** The conceptual mitigation plan includes compensatory mitigation consisting of constructing one vernal pool for every vernal pool occupied by shrimp that will be affected, and salvaging the top 2 inches of soil from affected vernal pools occupied by shrimp as inoculant for created vernal pools.

**Impact Summary.** Implementation of the project would result in the elimination of 10 vernal pools that support special-status shrimp. This impact is considered significant because the three species of shrimp found in these pools are proposed for listing as threatened or endangered by the USFWS and may be listed before completion of the project. It should be noted, however, that because of previous efforts to avoid and minimize impacts on special-status shrimp populations, only 10 of the estimated 306 shrimp populations on the project site will be affected. To reduce this impact to a less-than-significant level, implement the following mitigation measure:

- 10.1 Implement the conceptual wetland mitigation and monitoring plan for the project.

**California Tiger Salamander.** Surveys for California tiger salamander and western spadefoot toad in 1993 did not find these animals on the site; however, the USFWS remains especially concerned about the cumulative impacts of the Rancho Seco project and other projects in this area on the long-term viability of existing salamander populations in southeast Sacramento County. (Pierce pers. comm.) The USFWS has been petitioned to list the salamander as endangered under the federal Endangered Species Act. A 90-day finding concluded the action may be warranted, and a formal review of the animal's status has been initiated.

Construction of the project would result in the loss of about 1.2 acres of open water ponds which are seasonal in nature. To compensate for these wetland losses, the wetland plan proposes creation of two ponds totaling about 0.2 acre.

**Impact Summary.** Implementation of the project could result in loss of potential habitat for the California tiger salamander. This impact is considered significant. To reduce this impact to a less-than-significant level, implement the following mitigation measure:

- 10.1 Implement the conceptual wetland mitigation and monitoring plan for the project.

#### **Swainsons' Hawk**

**Impact Summary.** Implementation of the project would result in conversion of approximately 200 acres of annual grassland, which is potential foraging habitat for the Swainson's hawk. This impact is considered less than significant even though the Swainson's hawk is a state listed species, because the wetland mitigation plan preserves a substantial amount of annual grassland (over 1,000 acres), more than three times the 1:1 replacement suggested by DFG guidelines. Additionally, the wetland mitigation plan provides riparian enhancement along Rancho Seco Lake, which will improve potential perching, roosting, and nesting habitat for Swainson's hawk. No additional mitigation is recommended.

#### **Black-Shouldered Kite and Northern Harrier**

**Impact Summary.** Implementation of the project would result in the conversion of approximately 200 acres of annual grassland foraging habitat for the black-shouldered kite and Northern harrier. This impact is considered less than significant because the loss of this habitat would not substantially reduce black-shouldered kite or northern harrier populations in the local area or statewide, over 1,000 acres of suitable foraging habitat for these species will remain as open space, and the project site is surrounded by thousands of acres of annual grasslands. No mitigation is recommended.

## **Other Raptors**

**Impact Summary.** Implementation of the project would result in the conversion of approximately 200 acres of suitable foraging habitat for various birds of prey, including red-tailed hawks and great horned owls. This impact is considered less than significant because the amount of acreage lost is relatively small and its loss would not substantially reduce populations of raptor species, including Cooper's hawk, sharp-shinned hawk, golden eagle, ferruginous hawk, prairie falcon, merlin, and short-eared owl, in the local area or statewide. No mitigation is recommended.

**Special-Status Raptor Species.** Because the project site is habitat for black-shouldered kite, northern harrier, and tricolored blackbird, construction activities could potentially cause short-term disturbance to these special-status species. Although the construction activities would be temporary, the disturbance could cause the above-mentioned species to forage away from the construction areas or leave the project site temporarily. This impact is considered less than significant because construction activities would be temporary and the short-term displacement of these birds to adjacent areas would not cause local or regional decreases in populations of black-shouldered kite, northern harrier, or tricolored blackbird. In contrast, the disturbance of soil during construction can allow additional short-term foraging opportunities for these three species because of the removal of cover for their prey. No mitigation is recommended.

All known active raptor nests are located within preserve areas; therefore, no impacts on raptor nests are expected to result from project implementation. However, the potential exists for the establishment of new raptor nests on the project site before construction begins.

**Impact Summary.** Implementation of the project would result in the potential loss of active raptor nests, including burrowing owl nests, that could be disturbed or eliminated during construction. This impact is considered significant. To reduce this impact to a less-than-significant level, implement the following mitigation measure:

- 10.3 Conduct preconstruction raptor nest surveys and avoid raptor nests where found.

## **Tricolored Blackbird**

**Impact Summary.** Implementation of the project would result in the loss of approximately 200 acres of suitable tricolored blackbird foraging habitat. This impact is considered less than significant because over 1,000 acres of suitable tricolored blackbird foraging habitat on the project site will remain as open space under the proposed project and the proposed golf course greens (approximately 100 acres) would probably be used by tricolored blackbirds (there are numerous tricolored blackbird sitings at other golf courses). No mitigation is recommended.

## **MITIGATION MEASURES**

### **Recommended Mitigation Measures**

#### **10.1 Implement the Conceptual Wetland Mitigation and Monitoring Plan for the Project**

SMUD will implement the conceptual wetland mitigation and monitoring plan for the Rancho Seco Park master plan project dated October 28, 1993. The plan shall be implemented with the additions, changes, and clarifications included in the Nationwide Permit Number 26 authorized by the Corps on November 29, 1993.

#### **10.2 Obtain a Streambed Alteration Agreement from DFG**

SMUD will obtain a Section 1601 streambed alteration agreement from DFG prior to construction.

#### **10.3 Conduct Preconstruction Raptor Nest Surveys and Avoid Raptor Nests where Found**

To avoid inadvertent impact on special-status wildlife, SMUD will retain a qualified biologist to conduct preconstruction surveys for nesting raptors before beginning all grading work for the project and mitigation plan implementation. The timing of construction should be adjusted if sensitive species cannot be relocated.

### **Other Recommended Measures**

#### **Annual Grassland**

No mitigation is required for permanent loss of annual grassland; however, the location of staging areas and temporary access roads should be restricted to developed areas such as parking lots and fire roads to ensure that temporary disturbance of annual grasslands from construction activities is minimized.

#### **Wildlife Enhancement**

No mitigation is required for wildlife enhancement; however, the following measures are presented to encourage wildlife-compatible revegetation and development.

1. When possible, use native plants when landscaping. Once established, native plant species usually require less watering and care and offer more suitable forage and cover to wildlife species than exotic cultivated species. A list of suitable native plants is provided in Table 10-4.
2. Place wood duck nest boxes in trees near or overhanging the water edge of Rancho Seco Lake and appropriate stock ponds to attract wood ducks. Wood duck boxes do, however, require a minimal amount of care. A local Boy Scout group or other volunteer group could adopt the boxes and perform the routine annual cleaning. A detail of a wood duck nesting box is provided in Figure 10-1.
3. When possible, leave dead standing (snags) and fallen trees in place. They are habitat for a variety of wildlife species.
4. Place raptor perches in the annual grasslands. There are a limited number of perches used by raptors in the area. Additional perches for raptors would increase raptors' effectiveness as predators and would allow bird watchers a greater chance of observation of these birds of prey. A detail of a raptor perch is provided in Figure 10-2.

Table 10-4. Recommended Species to Plant in Landscaped or Open Space Areas at the Rancho Seco Project Site

Common Name	Botanical Name	Remarks	Wildlife Uses			
			Food	Cover	Roost/ Nesting	Beneficial Insects
<b>DRY, SUNNY SITES (UPLANDS)</b>						
<b>Trees</b>						
Blue oak	<i>Quercus douglasii</i>	dec,**	X	X	X	
Interior live oak	<i>Quercus wislizenii</i>	ev,**	X	X	X	
<b>Shrubs</b>						
Buck brush	<i>Ceanothus cuneatus</i>	ev,**	X	X		X
Western redbud	<i>Cercis occidentalis</i>	dec,**	X	X		
Flannel bush	<i>Fremontodendron californicum</i>	ev,*		X		
Toyon	<i>Heteromeles arbutifolia</i>	ev,**	X	X		X
Coffeeberry	<i>Rhamnus californicus</i>	ev,**	X	X		X
<b>MOIST OR SHADY SITES (RIPARIAN)</b>						
<b>Trees</b>						
Box elder	<i>Acer negundo ssp. californicum</i>	dec,**,M		X	X	
White alder	<i>Alnus rhombifolia</i>	dec,**,H		X		
Buttonbush	<i>Cephalanthus occidentalis</i>	ev,**,H		X	X	X
Oregon ash	<i>Fraxinus latifolia</i>	dec,**,H		X	X	
Sycamore	<i>Platanus racemosa</i>	dec,*L			X	X
Cottonwood	<i>Populus fremontii</i>	dec,**,M		X	X	
Valley oak	<i>Quercus lobata</i>	dec,**,L	X	X	X	
Arroyo willow	<i>Salix lasiolepis</i>	dec,**,M		X		X
California bay	<i>Umbellularia californica</i>	ev,**,M	X	X		
<b>Vines</b>						
Wild rose	<i>Rosa californica</i>	dec,**,M	X	X		
Wild grape	<i>Vitis californica</i>	dec,**,H	X	X		
<b>Grasses</b>						
California brome	<i>Bromus carinatus</i>	per,**	X	X		
Blue wildrye	<i>Elymus glaucus</i>	per,**	X	X		
Creeping wildrye	<i>Elymus triticoides</i>	per,**	X	X		
Red fescue	<i>Festuca rubra</i>	per,**	X	X		
Meadow barley	<i>Hordeum brachyantherum</i>	per,**	X	X		
Purple needlegrass	<i>Stipa pulchra</i>	per,**	X	X		
dec	=	deciduous				
ev	=	evergreen				
per	=	perennial				
*	=	native to northern California				
**	=	native to local region				
H	=	high flood tolerance				
M	=	medium flood tolerance				
L	=	low flood tolerance				



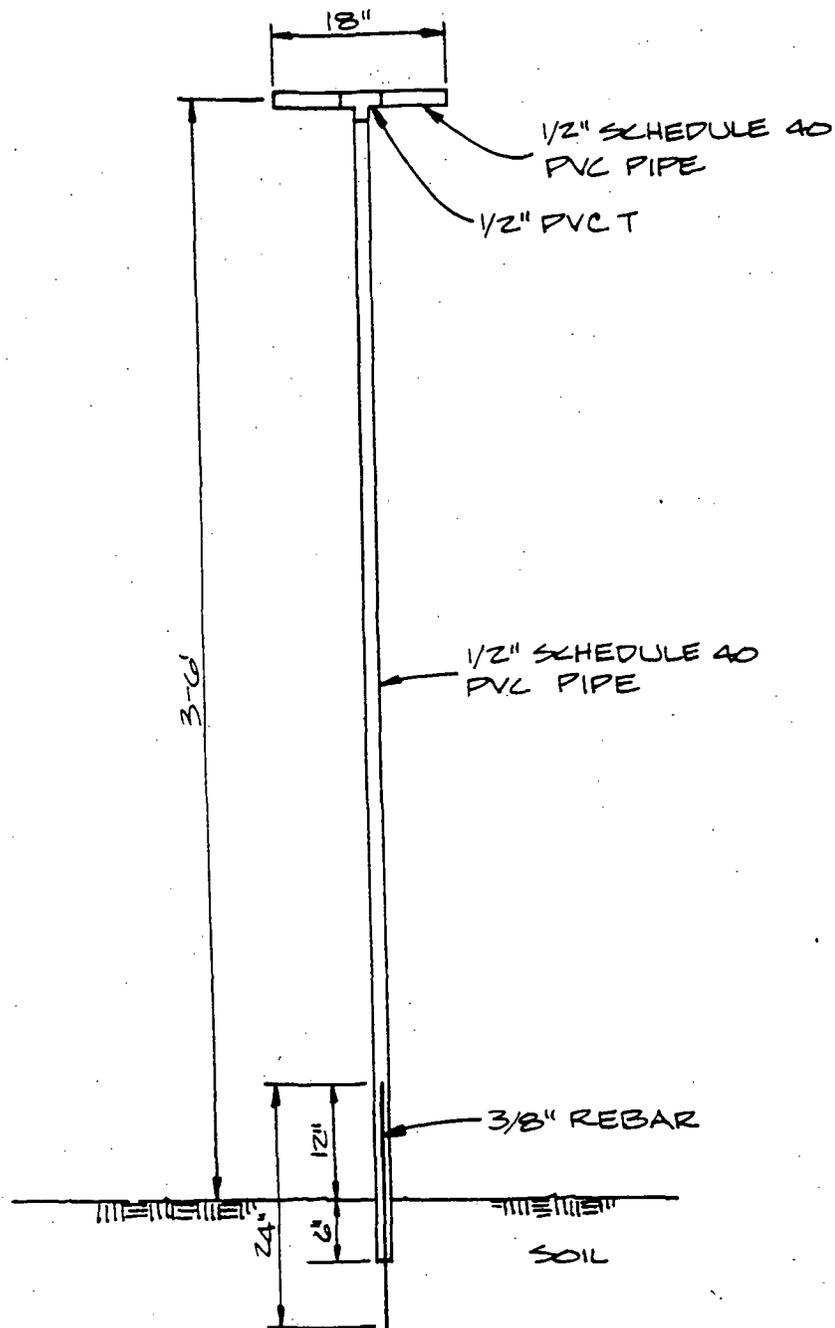


Figure 10-2. Raptor Perch Detail

## 8.2 Biological Resources

### 8.2.1 Introduction

This section describes the biological resources that occur in the general project area, including potentially threatened and endangered species, and the potential impacts to those species as a result of the proposed project. Furthermore, it describes the laws and regulations that apply to biological protection, the setting and conditions of the affected site, the methods that were used to evaluate the potential presence of threatened and endangered species, and the potential adverse impacts to biological resources as a result of project implementation. This section also discusses the feasibility of potential mitigation measures that would avoid, minimize, or compensate for adverse impacts.

### 8.2.2 Applicable Laws, Ordinances, Regulations, and Standards

The following section describes the primary laws and regulations that apply to potential impacts to biological resources in the project area, and the agencies responsible for enforcing regulations. Table 8.2-1 describes the LORS applicable to CPP biological resources (all tables are at the end of this section).

#### 8.2.2.1 Federal

##### **Federal Endangered Species Act (FESA, 16 USC 153 et seq.)**

Applicants for projects that could result in adverse impacts on any federally-listed species are required to consult with and mitigate potential impacts in consultation with the U.S. Fish and Wildlife Service (USFWS). An adverse impact is defined as a "take," which is prohibited except through authorization of a Section 7 or Section 10 consultation and Incidental Take Authorization. Take under federal definition includes "such act as may include significant habitat modification or degradation" (50 CFR §17.3). Species that are candidates for listing do not have the full protection of FESA; however, the USFWS advises project applicants that a candidate species could be elevated to listed status at any time, and, therefore, applicants should regard these species with special consideration.

**Migratory Bird Treaty Act (16 USC 703 to 711)** Protects all migratory birds, including nests and eggs.

**Bald and Golden Eagle Protection Act (16 USC 668)** Specifically protects bald and golden eagles from harm or trade in parts of these species.

#### 8.2.2.2 State

**California Endangered Species Act (Fish and Game Code Section 2050 et seq.)** Species listed under the Act cannot be "taken" or harmed, except under specific permit. At present, "take" means to hunt, pursue, catch, capture, or kill or to attempt to do so.

**Fish and Game Code Section 3511** describes bird species, primarily raptors, which are "fully protected." Fully protected birds may not be taken or possessed except under specific permit requirements.

Fish and Game Code Section 3503.5 protects all birds of prey and their eggs and nests.

Fish and Game Code Section 3513 makes it unlawful to take or possess or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

Fish and Game Code Section 4700, 5050, and 5515 list species that are fully protected in California.

Fish and Game Code Sections 1900 et seq. Native Plant Protection Act lists threatened, endangered, and rare plants listed by the state.

Title 14, California Code of Regulations, Sections 670.2 and 670.5 list animals designated as threatened or endangered in California. Species of Special Concern (CSC) is a category conferred by California Department of Fish and Game (CDFG) for those species that are considered to be indicators of regional habitat changes, or are considered to be potential future protected species. CSC do not have any special legal status, but are intended by CDFG for use as a management tool to take these species into special consideration when decisions are made concerning the future of any land parcel.

California Fish and Game Code (Sections 1601 through 1607) prohibits alteration of any stream, including intermittent and seasonal channels and many artificial channels, without a permit from CDFG. The limit of CDFG jurisdiction is subject to the judgment of the Department, up to the 100-year flood level. This applies to any channel modifications that would be required to meet the drainage, transportation, or flood control objectives of the project.

California Environmental Quality Act (Public Resources Code Section 15380) defines "rare" in a broader sense than the definitions of threatened, endangered, or CSC. Under this definition, CDFG can request additional consideration of species not otherwise protected.

California Environmental Quality Act (CEQA) requires that the effects of a project on environmental resources must be analyzed and assessed using criteria determined by the lead agency.

Warren Alquist Act is a CEQA-equivalent process implemented by the California Energy Commission. Preparation of this AFC will result in an Initial Study prepared by the CEC staff in fulfillment of the requirements of CEQA.

### **8.2.2.3 Local**

#### **Applicable Habitat Conservation Plans**

There are no Habitat Conservation Planning (HCP) areas in the project area in Sacramento County. The Cosumnes River Nature Preserve is a large natural area of riparian forests and floodplains bordering the Cosumnes and parts of Laguna Creek northwest of the project site. Also, the District plans to use property generally east of Rancho Seco Reservoir to develop a habitat mitigation bank for fairy shrimp and other vernal pool species. San Joaquin County, which is located 10 miles south of the project site, recently approved a county-wide HCP.

## **Sacramento County General Plan**

The Conservation Element of the County General Plan (1993) contains specific objectives to preserve water quality (see Section 8.14 and Table 8.2.2), and soils (see Section 8.9) that have benefits to biological resources. It also contains specific policies and goals for preserving marsh and riparian areas, vernal pools and ephemeral wetlands, urban streams, trees, rare and endangered species, fisheries, and for promoting resource conservation areas.

## **City of Elk Grove General Plan**

Portions of the proposed gas pipeline pass through the jurisdictions of Sacramento and the newly-formed city of Elk Grove. The Elk Grove General Plan is being developed presently, and until complete, relevant portions of the county plan area are being used. Both allow linear features such as gas pipelines in public rights of way and along streets, which is consistent with the project objectives. Because no other project features are anticipated in these jurisdictions, no extensive discussion of biological resource objectives is provided.

## **8.2.3 Setting**

The following sections describe the biological conditions in the project area, beginning with the vegetation types and habitat present in the project area, a description of wildlife typical to the area, and a discussion of specific special-status species known to occur in the general region. Specific conditions of the project setting that would support these resources are discussed subsequently in Section 8.2.4.

### **8.2.3.1 Location**

The project site is located in south Sacramento County, on the eastern edge of the Sacramento Valley. The project is at 150 feet elevation, at the base of the foothills that rise to the Sierra Nevada east of the project. The water supply line and electrical transmission line are in the same location and habitat conditions.

The new 24-inch gas pipeline begins in south Sacramento, crosses extensive road and railroad rights of way in the south County, crosses under several foothill streams and irrigation ditches typical of the Sacramento Valley, and then lies in a road ROW along Twin Cities Road and Clay East Road, in predominantly hay, alfalfa, and vineyards. The region's climate is Mediterranean, characterized by hot, dry summers and cool, wet winters. Summer high temperatures frequently exceed 100 degrees Fahrenheit (°F), winter temperatures are generally mild, with fewer than 20 freezing days per year. Rainfall averages 16.7 inches per year, most of which falls between November and March.

### **8.2.3.2 Habitat**

Habitat types potentially affected in the project area comprise agricultural, annual grassland, vernal pools, ephemeral streams and irrigation ditches, riparian shrub, and landscape and urban communities. See Figure 8.2-1 for location of biologically sensitive resources in the project area.

## **Agricultural**

Agricultural uses dominate both the project site and habitat along linear corridors. Habitat on the project site is pasture, while areas along the gas pipeline include vineyards, row crops, alfalfa farms, and pastures.

The project site is pasture, dominated by annual grasslands used for cattle grazing. The parcel is dominated by brome (*Bromus hordeaceus*, *B. diandrus*), oats (*Avena fatua*), and barley (*Hordeum murinum*), which are interspersed with forbs such as storksbill (*Erodium cicutarium*), wild radish (*Raphanus sativa*), and mustard (*Brassica nigra*). Other species identified in field surveys were bristly ox-tongue (*Picris echioides*), common bindweed (*Convolvulus arvensis*), broadleaf plantain (*Plantago major*), Italian ryegrass (*Lolium multiflorum*), slender wild oats (*Cavena barbata*), shepherds purse (*Capsella bursa-pastori*), *Sonchus* sp., and common malva (*Malva neglecta*). These species are widespread and are typical of disturbed grasslands. Most of the parcel is "natural," with the exception of Clay East Road, the southern access road to the Rancho Seco Plant. Surrounding parcels to the west and south are similar to the project site, also comprising pasture lands.

The wildlife species that commonly use pasture lands are the same as those that use annual grassland habitats. They include, California hare (*Lepus californicus*), voles (*Microtus californicus*), coyote (*Canis latrans*), and striped skunks (*Mephitis mephitis*). A wide variety of grassland birds such as Savannah sparrow (*Passerculus sandwichensis*), red-wing blackbird (*Agelaius phoeniceus*), and red tailed hawk (*Buteo jamaicensis*) are also present. The habitat is regionally plentiful and the species that occur there are generally widely distributed and abundant.

In more developed agricultural sites, such as vineyards or row crops, small ground-dwelling mammals are limited, but birds such as Brewer's and red winged blackbirds, starlings, house finches, and northern harriers are abundant. Larger mammals such as coyote, red fox, and striped skunks would be expected to forage in vineyards and row-cropped habitats.

## **Annual Grassland**

Annual grassland and ruderal vegetation dominate the project site, and the eastern portions of the gas pipeline. Annual grassland or ruderal grassland is present along roadways and the railroad rights of way throughout the gas pipeline corridor.

Introduced mediterranean grasses such as brome, oats, and barley characterize annual grassland. Dominant forbs also tend to be introduced species such as storksbill, wild radish, and mustard. Other species that occur commonly are the same as identified in pastures above (bristly ox-tongue, common bindweed, broadleaf plantain, Italian ryegrass, slender oat grass, shepherds purse, thistle, and common malva). These species are widespread and are typical of disturbed grasslands.

Wildlife species that use annual grassland are the same as listed above for pasture lands.

## **Vernal Pools**

Vernal pools are present on parcels north and east of the project site, and at several locations along the gas-line corridor.

Vernal pools that form from winter rains dry out in summer. The annual variation in hydrology and temperature support a community of highly adapted native species, and effectively exclude most of the invasive annuals that occupy most open upland habitats. Plants such as legeneria, downingia, orcutt grass, and navarretia are endemic to vernal pools, as are fairy shrimp, tadpole shrimp and tiger salamander (See Table 8.2-3 at the end of this section). Development and hydrologic modification have greatly reduced the area of California that supports vernal pools. The grassy plateau east of Rancho Seco Plant supports hundreds of vernal pools in a nearly natural state. Between the project site and the Rancho Seco Plant, there is a dense complex of vernal pools that is crossed by existing power lines and underground pipelines. Transmission lines and water supply lines for this project would also cross through this area. This particular complex of vernal pools is at a lower elevation than those east of the reservoir, and appear to support sparse vegetation and turbid water indicating a degraded condition.

Ephemeral ponds and drainage ditches that occur along roadsides and railroad berms can also exhibit some of the characteristics of vernal pools, including the seasonal hydrology, vegetation, and characteristic fauna. The Army Corps of Engineers evaluates these on a case-by-case basis to determine whether they are jurisdictional "wetlands" for the purposes of Section 404 of the Clean Water Act. Similarly, the USFWS generally defines these habitats based on whether they support or have the potential to support listed species such as fairy shrimp. Drainage ditches and ephemeral ponds occur along both sides of the Western Pacific Railroad south of Carson Ice-Gen Project, near the north end of the gas pipeline.

### **Riparian Communities**

Riparian communities occur near the project and along the gas pipeline corridor.

Approximately 0.25 mile east of the project site, old mine tailings detain surface runoff and support small oaks, willows, and pepper trees around ponded water. Further east, Rancho Seco Reservoir supports a substantial riparian forest community, including oaks, willows, cottonwood, and blackberry shrubs.

Clay Creek and Hadselville Creek do not support riparian communities in the project vicinity, but downstream of Twin Cities Road, portions of these streams support large willows, oaks, and cottonwoods. The most developed riparian communities border the Cosumnes River on both sides. The tall riparian forest in this area is a well-preserved example of "gallery forest," a tall climax community with a high closed canopy and open understory supporting abundant shrub growth.

### **Wetlands and Marshes**

The project site is crossed by two tributaries to Clay Creek that are considered seasonal ephemeral wetlands with sections categorized as seasonal marsh. These narrow swales contain water during the winter and spring, and pond water in the locations identified as marsh. In early summer, parts of these swales support sparse wild rye, spike rush, coyote thistle, pepper grass, curly dock, and velvet grass. In the areas identified as marsh there is enough water to support small areas of water primrose and aquatic buttercup. There is apparently not enough water to support cattails or bulrushes.

Wetland habitats on the project site imply conditions suitable to support Pacific treefrogs and potentially help amphibians such as tiger salamanders to move across the landscape, but do not have permanent water and dense cover that would support fish or highly aquatic species such as the giant garter snake.

The gas pipeline crosses or passes close to wetland and marsh habitats ranging from completely aquatic sites (Cosumnes River, Badger Creek, Laguna Creek), cattail and bullrush marsh (Cosumnes River), farm ponds (Arno Road, Valensin Road), roadside ditches and swales (near town of Franklin, south of CCF), and, as described above, vernal pools. Wetland and marshes support a high-density and variety of wildlife species, and many listed species. Swainson's hawks, giant garter snakes, and western spadefoot toad are all closely associated with wetland habitats, as are all fish. These sites are universally regarded as sensitive, and a variety of methods are used to avoid impacts to the biological resources that occur there.

### **8.2.3.3 Special-Status Species**

Special-status plant and animal species were determined from the California Natural Diversity Data Base (CNDDDB) (see Appendix 8.2A), consultations with agency personnel (see Appendix 8.2B), and field surveys. Special-status species that are recorded or that could potentially occur in the project area are listed in Table 8.2-3 at the end of this section. The District has done extensive field surveys work in the vicinity of the project. The site was field surveyed for the original development of the Rancho Seco Plant (ca. 1969), has been surveyed various times recently to develop a mitigation bank for fairy shrimp, and was surveyed in 1994 as part of the Master Plan for development of the Rancho Seco Park (SMUD, 1994). The District also retained biologists from Davis Environmental and Garcia and Associates to prepare a special-status biological resources survey for the project site and approximately 0.5 mile radius (Garcia, 2001), as well as a wetland delineation (Davis, 2001). CH2M HILL biologists also performed reconnaissance surveys on April, July and August, 2001 to confirm prior information. The qualifications of field surveyors in 2001 are provided in Appendix 8.2C.

Records of special-status species occurring along the gas pipeline were determined from CNDDDB searches by Davis Consulting. These were supplemented by mapping habitats that could support special-status species (such as vernal pools, wetlands, riparian forest, farm ponds) on recent aerial photographs at a scale of 1:6,000. Data on these maps and personal knowledge of the resources of the area were used to plan the gas pipeline for locations that would have less potential to adversely affect special-status species. Potential impacts to species along the pipeline are generally temporary, and largely avoidable. Therefore, the description of these species is abbreviated here, and mitigation is focussed on avoiding the types of habitat that support these species (e.g., vernal pools and other wetlands).

#### **Special-Status Plants**

There are 16 special-status species plants that could potentially occur in the project vicinity and along the gas pipeline corridor. Special-status plants that occur in the project vicinity can be generally grouped by the habitat they occupy. Ione manzanita, Ione buckwheat and Parry's horkelia are all specific to the Ione formation of soils. Bisbee

Peak rush-rose is confined to serpentine soils. Neither of these habitats occurs in, near, or would be affected by the project.

Rose-mallow, Mason's lilaepsis and Sanford's arrowhead are specific to shallow freshwater marsh habitat, which does not occur on the project site, but is present in several areas crossed by the gas pipeline. There are no known records of these species in the locations crossed, but the District will avoid impacts to these species by avoiding the habitats that could support them.

Vernal pool species that could potentially occur in the project area or along the gas pipeline include Boggs Lake hedge hyssop, legenera, pincushion navarretia, slender Orcutt grass, and Sacramento orcutt grass. Several of these are known from vernal pools in the south Sacramento area, although there are no known records of these species directly on project alignments or on the project site. Garcia and Associates' botanists, Virginia Danes and Lisa Infante, intensively surveyed the project site on March 12, April 2, and May 7, 2001. The vernal pools that occur east of the project site and on both sides of the gas line near Franklin Boulevard are potentially suitable habitat for several of these species.

### **Special-Status Animals**

Sixteen special-status animals potentially occur in the project area and along the gas supply lines (see Figures 8.2-2a through 8.2-2c). Of these, four species are likely to occur in the vicinity of the project site or in features crossed by the gas pipeline. The vernal pool fairy shrimp, vernal pool tadpole shrimp, and tiger salamander are known to occur in vernal pools east of the project site, and the former could occur in vernal pools along the northern end of the gas pipeline.

Vernal pool fairy shrimp and vernal pool tadpole shrimp are short-lived crustaceans, approximately 1-inch long, that live in vernal pools and occasionally ditches or swales that have similar hydrology to vernal pools. They exist as cysts (eggs) in the summer, and hatch when hydrated by winter rains. They are known to occur in vernal pools east of Rancho Seco, and north of the project site. There are no known localities on the project site that would be directly affected, but because the species is readily transferred among pools in close proximity, any vernal pools in the project vicinity are considered by the USFWS as potential habitat. The gas pipeline alignment crosses many railroad-berm ditches, in the vicinity of Franklin Boulevard that have hydrology similar to vernal pools, and there is a high likelihood that the species is present there.

The giant garter snake (GGS) is known to occur in the Cosumnes River Nature Preserve, and could be present in Badger Creek, Laguna Creek, or connected waterways that support appropriate habitat. Appropriate habitat for GGS comprises dense cattail or bulrush cover, with downed woody debris and partial shading to provide thermal cover.

Valley elderberry shrubs are the obligate host of the valley elderberry longhorn beetle. CNDDDB records indicate this species is likely to occur along the Cosumnes River or any crossing where elderberries are present.

The Swainson's hawk is a state-listed species that spends the winter in Mexico and South America and migrates to the prairie states and California to breed in the summer.

There is evidence to indicate that the population that breeds in California is distinct from those in the central United States and may warrant additional protection. Swainson's hawks nest in large riparian cottonwoods or oaks, and forage over short-grass prairies and farm fields up to 10 miles from the nest. Swainson's hawks are sensitive to disturbance during nesting and CDFG recommends a 0.5-mile buffer between construction and active nests. There is only one recorded nest within 0.5 mile of the proposed gas pipeline, and none near the project site. However, suitable trees occur frequently along the gas pipeline route, and around the reservoir east of the project site. A Swainson's hawk could nest in any of these in any year. No Swainson's hawks were observed foraging on the project site during field surveys although the habitat is suitable.

California tiger salamander is a species of special concern that breeds in vernal pools and ephemeral ponds. When the pools dry, the adult salamanders spend the summer in burrows in upland grasslands near the pools. They are known to move up to a mile from breeding sites. There are records of the species in pools east of Rancho Seco, but no suitable breeding habitat occurs on the project site. The gas pipeline crosses several wetland areas that are potentially suitable, but there are no known records of tiger salamander in these areas.

Western pond turtle is a species of special concern that is highly aquatic, and nearly always found in or close to water. The pond turtle exits water to lay eggs in grasslands near the ponds, but does not move far from permanent water. Western pond turtle have been observed in Clay Creek, north of the project site, and are common in the Cosumnes River watershed crossed by the gas pipeline. They are also likely to occur in Badger Creek and Laguna Creek.

Burrowing owls are a species of concern to both USFWS and CDFG. While they occur from Canada to South America, their habitat in California and the western states is being reduced by land conversions for urban and agricultural uses. Most burrowing owls in this region are migratory, spending winters in southern California or Mexico, and appearing in Sacramento to breed in summer. Burrowing owls occupy and nest in abandoned ground squirrel burrows, particularly along the relatively barren area along railroad tracks and road cuts. They are likely to occur seasonally along the railroad tracks west of Franklin Boulevard, and along Twin Cities Road. Burrowing owls tend to use the same burrows from year to year, such that the presence of burrowing owls usually indicates they will be back in following years. None was seen on or adjacent to the project site, however, young owls could colonize any suitable squirrel burrows in any year.

The tricolored blackbird is listed as a California Species of Concern. Tricolored blackbirds are sporadic migrants and summer residents throughout California's Central Valley and the Sierra Nevada foothills. They generally breed near fresh water and emergent vegetation, such as tall, dense cattails or tules, or willow thickets. They are distinct from their smaller cousins, the red-winged blackbird in that they breed in huge colonies often of 1000 birds or more, but seldom breed in the same place every year. Their sporadic movements and unpredictable reproduction cycles make it especially difficult to predict when and where they will occur, although they tend to return to traditional nest sites every 3 years or so. Land conversion for agriculture and urban

development and massive nest predation has resulted in this species being greatly reduced from former numbers. There is no suitable nesting habitat on or adjacent to the site or project linears.

The western spadefoot toad is a species of special concern to CDFG. This homely gray amphibian is named for a horny protuberance on the hind leg that it uses for digging into hard clay soils to escape arid conditions. It breeds in vernal pools and ephemeral ponds in winter and spring, and by the time they dry, the toad has matured and crawls into the grassy uplands for refuge. Like many species that depend on vernal pools and ephemeral ponds, the range and number of spadefoot has been greatly reduced by habitat modifications, changes in hydrology, and urbanization. Their distribution in Sacramento is spotty and they are not recorded from the project site or from any records along the gas pipeline. Field surveys for both this project and the Rancho Seco Master Park Master Plan (SMUD, 1994) failed to detect any toads.

### **8.2.3.2 Biological Surveys**

Biological surveys for the general project area were performed by biologists from Jones & Stokes on February 8, 9, 10, 19; March 5, 19; April 3; and May 19, 20, 21, 1993 in support of the Rancho Seco Master Plan (1994). Additional surveys were conducted on March 5, 6, 7, 16, 29 and April 5, 2001 by aquatic ecologists Robert Aramayo and Charleen Gavette. Botanists Virginia Danes and Lisa Infante walked meandering transects and intensively surveyed suitable habitat for special-status plants on March 12, April 2, and May 7, 2001. Wetland delineations of the project area were performed by Ellyn Davis on April 6 and April 10, 2000. EJ Koford performed reconnaissance survey of the site to confirm findings of the earlier surveys in April 2001. Qualifications of all field surveyors are provided in Appendix 8.2C. The field surveys, in conjunction with aerial photographs, were sufficient to determine the types of habitat present and the suitability for supporting special-status species on the project site and general vicinity.

## **8.2.4 Environmental Consequences**

Potential impacts to biological resources were evaluated to determine permanent and temporary effects of project construction, operation, maintenance, and decommissioning of the CPP project and supporting facilities.

A summary of potential impacts is presented in Table 8.2-4.

### **8.2.4.1 Standards of Significance**

Impacts on biological resources are considered significant if one or more of the following conditions could result from implementation of the proposed project:

- Substantial effect, reduction in numbers, restricted range, or loss of habitat for a population of a state- or federally-listed threatened or endangered species
- Substantial effect, reduction in numbers, restricted range, or loss of habitat for a population of special-status species, including fully-protected, candidate proposed for listing, species of special concern, and certain CNPS list designation

- Substantial interference with the movement of any resident or migratory fish or wildlife species
- Substantially diminish or reduce habitat for native fish, wildlife, or plants
- Substantial disturbance of wetlands, marshes, riparian woodlands, and other wildlife habitat
- Remove trees designated as heritage or significant under County of local ordinances

#### 8.2.4.2 Project-Specific Impacts

##### Potential Impacts of Construction and Operation of Project Site

##### *Potential Impacts to Special-status Species*

- 1) Construction of the project site would potentially fill one vernal pool, estimated to be less than 0.01 acre in size. Elimination of this vernal pool would have potential adverse impacts on fairy shrimp, tadpole shrimp, and other species that use vernal pools. The pool was surveyed in spring of 2000, and no special-status plants were found there. Generally, loss of such a small area would not be considered significant; however, the project anticipates providing mitigation for other vernal pools, and therefore would add this acreage into the total mitigation provided. Mitigation would consist of providing habitat and management of existing or created vernal pool to support the resources that would be affected by the project. The loss of this vernal pools is considered potentially significant, but can be mitigated to a level of less than significant.
- 2) Construction of the water supply pipeline and transmission line between the project site and the Rancho Seco Plant would potentially trench or fill historical vernal pools that may support fairy shrimp, tadpole shrimp, western spadefoot or tiger salamanders. Care in siting the pipeline and transmission towers to avoid sensitive vernal pools would reduce the potential for adverse impacts to less than significant.
- 3) Construction on the project site could potentially adversely affect tiger salamanders estivating in upland burrows. Although not recorded from the project site, tiger salamanders occur within one mile of the project site, and could potentially spend the summer in burrows over a wide area that includes the project site. Because no tiger salamanders were observed to use the project site, or areas adjacent to it, the loss of any tiger salamanders from project construction would be a small proportion of the population that uses the Rancho Seco vernal pools and surrounding grasslands. The number of salamanders likely to be within the project footprint and disturbed during construction would likely be an insignificant portion of the population. Impacts to tiger salamander from project construction is considered to be less than significant.
- 4) Swainson's hawks could potentially nest in the riparian trees in the mine tailings 0.3 mile east of the project site, or in the trees surrounding Rancho Seco Reservoir. If present, construction at the project site could potentially cause nest abandonment, and would reduce the available foraging habitat for this species by 30 acres. No Swainson's hawks are recorded, or were observed in these areas during field surveys for this project. Therefore, the potential for Swainson's hawks to be present during

construction is considered low. Pre-construction surveys could establish whether hawks are present there or not. With pre-construction surveys to ensure hawks are not nesting closer than 0.5 mile from the project, adverse impacts could be reduced to less than significant.

- 5) Wastewater from the proposed facility would be discharged to Clay Creek, which is a tributary to the Cosumnes River. Degradations in water quality could cause adverse effects on anadromous fish (salmon, steelhead) and native minnows (Sacramento splittail, delta smelt) that live in the Cosumnes River. The project would be required to obtain and comply with an NPDES permit for discharge, that would specify the water quality, monitoring, and reporting requirements for the discharge. The RWQCB is responsible for authorizing discharges that will not have significant adverse effects on beneficial uses, including the habitat of warm and coldwater fish. Obtaining and complying with an NPDES permit will reduce the potential for adverse impacts to less than significant.
- 6) Water will be applied to the site for dust control during construction. Erosion and sediment washed into surface waters would be potentially harmful to water quality of Clay Creek and species that occupy it. The District would be required to have a Stormwater Pollution Prevention Plan as part of compliance with a construction NPDES permit. The permit specifies BMPs to avoid sediment runoff and erosion that would cause water quality degradation. Therefore, this impact will be less than significant.

#### **Potential Impacts to Wetlands**

- 1) Construction on the project site would fill approximately 27,550 cy, at a slope of 1 percent with consequent potential adverse impacts to plants and animals that occupy that habitat. Although the project would fill parts of the historical channels, these same channels would be re-routed around the outer edge of the project site, and restored to as natural a state as practical. Within 3 years, the re-routed channels would support vegetation, hydrologic conditions, and fauna typical of the existing wetlands. The length and width of these re-routed channels would be greater than those filled. The details of channel filling and re-routing would be permitted through the Section 404 process, and related Section 401 water quality certification. Complying with the conditions of these permits would reduce impacts from re-routing the channels to less than significant.
- 2) Operation of the stormwater detention basin north of the proposed project site would potentially form some wetland-type vegetation in an area that is presently upland annual grassland. The stormwater detention pond is intended to capture water from the paved area of the project site and store it temporarily, releasing it at a slow rate into Clay Creek. This would prevent potentially damaging peak flows in Clay Creek, and in the temporarily inundated area potentially becoming more suitable habitat for wetland plants and animals. The result may be beneficial to wetlands, but the adverse impacts would be less than significant.
- 3) Cooling water discharge from the CPP would potentially degrade the quality of water in Clay Creek, with consequent adverse impacts on beneficial uses of the creek, including warm and coldwater habitat for fish and other species. As discussed

in Section 8.14, this discharge would be evaluated and authorized under the NPDES permit program of the CWA. An NPDES permit requires that the application for discharge be reviewed by engineers and toxicologists and an assessment made whether the discharge would potentially cause adverse impacts to other users of the river. No authorization would be granted if adverse impacts are anticipated. The permit includes provisions for regular testing, monitoring, and reporting to the Regional Water Quality Control Board (RWQCB) and provisions for renewing or terminating the permit in the future. Obtaining the NPDES permit and complying with the requirements for maintaining water quality, monitoring, and reporting would effectively ensure that potential adverse impacts to biological resources are less than significant.

- 4) Construction of the project would potentially result in temporary increases in sedimentation to Clay Creek, with consequent adverse impacts to aquatic and amphibian species that use the creek. These impacts would be temporary and would be expected to ameliorate over time as soil cover and vegetation regrow over the site. The potential adverse impacts would be minimized by obtaining and complying with an NPDES stormwater construction discharge permit. The permit specifies measures to be implemented at the site to avoid, minimize, or compensate for potential adverse impacts to water quality. With implementation and compliance with the NPDES stormwater permit, potential impacts to aquatic habitat downstream of the project would be less than significant.

#### **Potential Impacts of Cooling Tower Drift**

Cooling tower drift is the fine mist of water droplets that escape the cooling tower's mist eliminators and is emitted into the atmosphere. Cooling towers concentrate the particulates (total dissolved solids) during the cooling process and produces a salt mist. Salts can physically damage leaf cells of leaves, which affects the photosynthetic ability of the plant. Other effects include blocking the stomata (leaf pores) so that normal gas exchange is impaired, as well as affecting leaf adsorption and solar radiation reflectance. These effects can cause reduced productivity in crops, forest trees, and sensitive special-status plant species within a deposition area.

Studies performed by Lerman and Darley (1975) concluded that particulate deposition rates of 365 g/m<sup>2</sup>/year caused damage to fir trees, but rates of 274 g/m<sup>2</sup>/year and 400 to 600 g/m<sup>2</sup>/year did not cause damage to vegetation at other sites. Pahwa and Shipley (1979) exposed vegetation (i.e., corn, tobacco, and soybeans) to varying salt deposition rates to simulate drift from cooling towers that use saltwater (20 to 25 parts per thousand) in the circulation water. Salt stress symptoms on the most sensitive crop plants (soybeans) were barely perceptible at a deposition rate of 2.98 g/m<sup>2</sup>/year (Pawha and Shipley, 1979).

Assuming a particulate deposition rate of 0.2 centimeters per second and a maximum salt deposition rate of 0.24 micrograms per cubic meter (the cooling tower particulate matter deposition rate), the expected deposition rate is 1.5E-02 g/m<sup>2</sup>/year, which is significantly less than levels expected to cause barely perceptible to the most sensitive crop plants.

Cooling tower drift is not expected to have any impact on vegetation in surrounding habitats within the maximum impact radius for the CPP cooling towers drift.

### **Impacts to Trees**

There are no trees on the project site or adjacent to it. There would be no adverse impact to native or heritage trees from the proposed project.

### **Potential for Collision and Electrocution Hazard to Birds**

The project would construct four exhaust stacks as high as 160 feet that could potentially result in a few bird collisions. Most bird collisions recorded in the literature involve nocturnal migrants flying at night in inclement weather and low visibility conditions, colliding with tall guyed television or radio transmission towers. Migratory birds generally fly at an altitude that would avoid ground structures, except when crossing over topographic features such as ridge tops, or when inclement weather forces them down closer to the ground. The project area is not known to be a path for nocturnally migrating birds. There are no topographic or ecological features that would attract birds to this location or "funnel" them into the vicinity of exhaust stacks or other elevated features of the project. Because of the relatively low structure height and lack of guy wires, the potential for bird collisions with stacks, structures, and towers of the project is considered less than significant.

Bird collision with new electric transmission lines and towers are similarly expected to be rare because of the relatively low height of the poles (approximately 120 feet) and the location away from migratory pathways, ridgetops and concentrations of waterfowl. The potential for collision is considered less-than-significant.

Large raptors can be electrocuted by transmission lines when a bird simultaneously contacts two conductors of different phases, or a conductor and a ground. All electrical transmission lines for the present project are constructed with sufficient clearance between conductors and ground to protect large birds from electrocution. Installation of transmission lines and towers according to "raptor-proof" guidelines in the "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996" (APLIC, 1996) would reduce potential impacts to less than significant.

### **Impacts of Gas Line Construction and Operation**

#### **Potential Impacts to Special-Status Species**

- 1) Construction of the natural gas pipeline would pass through or near potential habitat for several special-status species. Potential impacts to these species are minimized by routing the pipeline to the greatest extent practical within roadways, railroad berms, and under rivers and sensitive marsh or aquatic habitat. However, the pipeline may still be within 0.5 mile of Swainson's hawk nests, or pass closer than 250 feet from burrowing owl nests. Burrowing owls are known to nest in squirrel burrows along railroad tracks and roadside areas, and could also be present during construction. If hawk hosts are encountered within 0.5-mile of any construction area (i.e., gas pipeline), construction schedules can be adjusted seasonally to limit activities during the sensitive nesting period (February-July). This would further reduce impacts to less than significant. Implementation of Environmental Awareness training, pre-construction surveys, and seasonal avoidance would reduce impacts to nesting birds to less than significant.

- 2) The gas pipeline may cross through ephemeral ponds, railroad ditches or vernal pools that could potentially support fairy shrimp or tadpole shrimp. When the final pipeline alignment is defined, the District will quantify the area of affected potential fairy shrimp habitats. Construction activities in these areas would be planned to minimize the size and extent of habitat disruption. Surface soils would be lifted, stored, and replaced after construction, and contours replaced. Adverse impacts to vernal pools would be mitigated by providing off-site preservation, creation, or restoration at the Rancho Seco mitigation site, or as agreed upon in consultation with the USFWS and ACOE. Construction of the pipeline would cause both temporary and permanent impacts that are potentially significant. The impact would be avoided, minimized, and reduced to an extent that would be considered less than significant.
- 3) The construction laydown area would cover approximately 20 acres on the south side of Clay Station East that has not been evaluated for the potential presence of vernal pools and special-status species. Impacts to this area would consist of temporary vegetation clearing, compaction, and dust generation. However, the site would be restored to pre-construction conditions after construction and, therefore, would sustain no long-term adverse impacts. Based on aerial photography of the site, there are no significant habitats present that would cause adverse effects to special-status species. The impacts from construction would be temporary and less than significant.

#### ***Potential Impacts to Wetlands***

- 1) Construction of the gas pipeline would cross under three major rivers (Cosumnes River, Badger Creek, Laguna Creek) and would potentially cause adverse impacts to habitat and water quality supporting important biological resources. Riparian and marsh habitat would be avoided by using HDD construction to bore under sensitive resources. Except in the case of a boring failure, the important wetland resources of habitat and water quality would be unaffected by project construction. To reduce the potential impacts of a boring failure ("frac out"), the District has developed a frac out emergency response plan that describes the actions that would be taken to contain and control any damages resulting from a frac out. The plan describes the resources present, describes access routes that would be used to enter the area in the event of a frac out, and the means by which waste materials would be contained and removed from the area. The frac out plan contains methods and agreements for restoration of biological resources that would be adversely affected. With implementation of HDD to avoid sensitive resources and the frac out plan to respond to any construction failures and consequent adverse effects, the impacts of the construction on the biological resources of any rivers will be less than significant.
- 2) Construction of the gas pipeline would cross many minor irrigation ditches and drainages that are not major rivers. Although small, these ditches have wetland features that represent valuable habitat to certain biological resources. These biological resources can include aquatic, amphibian, and terrestrial species. Depending on the specific location, impacts to biological resources from crossing small irrigation ditches and drains is potentially significant. Most of these drainages receive flow from man made sources, including irrigation supply, irrigation

tailwater, and stormwater. Such water bodies are generally discontinuous and are often dry 4 to 6 months per year (generally in early winter months). The District would propose to construct through these locations either by using HDD methods (and preparing a frac out plan, as noted above), or by trenching through the drainage during the dry season when most significant biological resources are absent. The latter is permitted under Nationwide Permit 12 issued by the ACOE, with attached conditions to reduce potential adverse impacts to wildlife and water quality. Wherever the gas pipeline crosses drainage ditches or other potential wetland features that could support significant biological resources, this will be accomplished by HDD, by open trench under authorization of NWP 12 or in a manner agreed to by the agencies and the District.

- 3) The pipeline will require pressure testing after construction to ensure welds are tight and to remove any accumulated dust or welding residue from the pipeline. To do this, the pipe is filled with water and pressurized, resulting in a potentially large volume of water. If disposed improperly, this water could cause adverse effects on wetlands and water quality of receiving waters. The District proposes to dispose pipe-testing water to the SRWTP, either by collecting the wastewater in trucks and taking it to the SRWTP or disposing it to a sewer line that leads to the SRWTP. In no case will pipeline test water be disposed to surface soil unless tested to confirm its quality is suitable. Disposal to the SRWTP will ensure impacts of wastewater disposal are less than significant.

#### ***Impacts to Trees***

The gas pipeline is sited to avoid requiring the removal of any trees. However, should it become necessary to remove one or more trees for construction, they will be measured, recorded, and mitigated in accordance with the appropriate requirements specified by the County Tree Coordinator. It is not anticipated that any trees will require removal. Therefore, this impact is considered less than significant.

#### **Conflict with Regional Habitat Conservation Plans**

There is no County-wide or regional Habitat Conservation Plan in South Sacramento County. Therefore, construction of the project would not conflict with goals of any County Habitat Conservation or other regional conservation plan. The consistency of project construction under the Cosumnes River preserve, which is a major regional preserve area, and in the vicinity of Rancho Seco, which is being developed as a major resource conservation area, would be planned so as not to conflict with these preserve areas' goals. Therefore, no significant impact is expected.

#### **8.2.4.3 Cumulative Impacts**

The CPP project would convert approximately 30 acres of annual grassland pasture habitat for industrial uses. Annual grassland is an abundant and widespread habitat type. The CPP project would be located in an area that is already designated and dedicated for electrical generation. The site was originally within the planning area intended to be used for a second generating facility to have been located adjacent to Rancho Seco Plant. The remaining area around Rancho Seco Plant has been dedicated to open space and preserve, as described in the Rancho Seco Park Master Plan (SMUD, 1994). Such open

lands were set aside since the 1970s, and biological resources planning for the County has always shown this area converted to industrial use.

The gas pipeline for the project was sited to minimize the potential impacts on sensitive biological habitats.

This project, in conjunction with other projects planned for the area, would not have significant adverse impacts on biological resources.

## **8.2.5 Proposed Mitigation and Monitoring**

The following sections describe proposed mitigation intended to avoid, minimize, or compensate for potential adverse effects of the project, and to monitor and document the effectiveness of mitigation.

### **8.2.5.1 Overall Project Construction**

The following measures would be implemented in all CPP construction areas:

- Provide worker environmental awareness training for all construction personnel that identifies the sensitive biological resources and measures required to minimize adverse project impacts during construction and operation.
- Provide mitigation construction monitoring by a qualified Designated Biologist during construction activities near sensitive habitats.
- Prepare a Biological Resources Mitigation and Implementation and Monitoring Plan (BRMIMP) that outlines how the District would implement the mitigation measures developed to ensure that 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. The BRMIMP outline is presented in Appendix 8.2D.
- Avoid sensitive habitats and species during construction by developing construction exclusion zones and silt fencing around sensitive areas.
- Conduct additional preconstruction surveys for sensitive species in impact areas during the spring before construction begins, particularly within 0.5 mile of potential raptor nest trees, and within 250 feet of potential burrowing owl burrows.
- Prepare construction monitoring and compliance reports that analyze the effectiveness of the mitigation measures.
- All areas not required for permanent easements and development would be restored to pre-construction conditions, including topography, hydrology, topsoil, and, if appropriate, revegetation.

### **8.2.5.2 Special-Status Species**

Specific mitigation/protective measures were developed to minimize project impacts for the sensitive habitats potentially occupied by vernal pool fairy shrimp, vernal pool tadpole shrimp, Swainson's hawk and burrowing owl. A formal consultation with USFWS under Section 7 of the ESA will be completed by the District and a biological

opinion issued by USFWS prior to construction. The District agrees to abide by the conditions of the Section 7 permit, which may include the following additional mitigation/protective measures that would be implemented in these sensitive areas.

### **Vernal Pool Crustaceans**

- Avoid disturbance of suitable habitat to the extent practical by changing linear alignments, minimizing construction corridors and controlling construction access.
- Conduct habitat-level verification surveys in late winter 2002, at locations potentially occupied by vernal pool crustacea, to determine habitat presence and suitability to support special-status species. Potentially affected habitat area would also be quantified.
- Obtain and comply with the conditions of a Section 7 authorization for take of these species, including providing mitigation land according to the ratios and conditions described in the Section 7 consultation.

### **Swainson's Hawk**

- Implement nest surveys within 0.5 mile of project features to determine use by Swainson's hawk.
- If project features are within 0.5 mile of Swainson's hawk nesting, avoid construction within 0.5 mile during nesting season, if feasible.
- If construction cannot avoid active nests by 0.5 mile, the District will apply for and comply with an incidental take agreement under Section 2080.1 for Swainson's hawk.

### **Burrowing Owl**

- Conduct preconstruction surveys in the spring (before February 1) of construction areas to determine if habitat is occupied by burrowing owls.
- Implement mitigation measures that protect burrowing owls by passive relocation and/or restriction of construction activities within 150 feet during non-breeding season or 250 feet of active burrowing owl nest burrows during breeding season (February 1 through August 31).

### **Foraging Raptors, Herons, Egrets, and Waterbirds**

- Design "raptor-friendly" electric transmission lines as described in the "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996" (APLIC, 1996).
- Provide safety lighting that points downward on the HRSG stacks to reduce avian collisions.

### **Fishes and other Aquatic Biota**

- Obtain and comply with conditions of NPDES permit for wastewater discharge to protect quality of water supporting fish downstream of the project in Clay Creek and the Cosumnes River.

- Obtain and comply with conditions of NPDES permit for construction stormwater, to protect quality of water supporting fish downstream of the project in Clay Creek and the Cosumnes River.

### **Gas Pipeline Construction**

- All project linears would be surveyed prior to construction to identify significant biological resources that require avoidance or protection.
- Avoidance, protection, and worker awareness training would be detailed in the project BRMIMP (see Appendix 8.2D).
- Construction would be constrained within a designated construction corridor, generally 75 feet wide or less.
- Any wetlands crossed by project linears would be avoided, or crossed in compliance with conditions specified by a Section 404 Permit or Streambed Alteration Agreement, as appropriate.
- Any HDD under wetlands would be accompanied by preparation and implementation of a "frac out" plan to describe emergency response to a potential boring failure. The frac-out plan would be prepared in consultation and coordination with the USFWS, CDFG, NMFS, and CEC CPM.
- Construction site would be restored to pre-existing contours and re-vegetated after construction.

### **8.2.6 Involved Agencies and Agency Contacts**

Table 8.2-5 lists the contacts for the CPP Project.

### **8.2.7 Permits Required and Permit Schedule**

Table 8.2-6 lists the required permits and permit schedule.

### **8.2.8 Reference**

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**TABLE 8.2-1**

**Laws, Ordinances, and Regulations Applicable to CPP Biological Resources**

<b>LORS</b>	<b>Purpose</b>	<b>Regulating Agency</b>	<b>Permit or Approval</b>	<b>AFC Conformance and Applicability</b>
<b>Federal</b>				
Endangered Species Act of 1973 and implementing regulations, Title 16 United States Code (USC) §1531 et seq. (16 USC 1531 et seq.), Title 50 Code of Federal Regulations (CFR) §17.1 et seq. (50 CFR 17.1 et seq.).	Designates and protects federally threatened and endangered plants and animals and their critical habitat.	USFWS and NMFS	Issues, Biological Opinion, or Authorization with Conditions after review of project impacts.	The District has sited facility to avoid habitat for endangered species. Pipeline may cross potential habitat, and the District will obtain Section 7 authorization in conjunction with Section 404 permit for fairy shrimp if necessary. Section 8.2.4.2
Section 404 of Clean Water Act of 1977	Requires permit to fill jurisdictional wetlands.	USACE	Section 404 Permit	The District will avoid wetland fills by using HDD, or will open trench in compliance with NWP 12. Section 8.2.4.2
Section 401 of Clean Water Act of 1977	Requires the District to conduct water quality impact analysis for the project when using 404 permits and for discharges to waterways.	CRWQCB	Water Quality Certification	The District will obtain 401 Certification if required. Section 8.2.4.2
Suggested Guidelines for Raptor Protection (APLIC, 1996)	Describes design measures to avoid and reduce impacts to raptors from electrical transmission and other facilities.	CEC	CEC Conditions of Approval	The District will implement design measures to protect raptors from collision and electrocution. Section 8.2.4.2
Migratory Bird Treaty Act 16 USC §§703-711	Prohibits the non-permitted take of migratory birds.	USFWS and CDFG	CEC Conditions	The District will avoid take of migratory birds, including nest and eggs. Section 8.2.4.2

**TABLE 8.2-1**  
Laws, Ordinances, and Regulations Applicable to CPP Biological Resources

LORS	Purpose	Regulating Agency	Permit or Approval	AFC Conformance and Applicability
<b>State</b>				
California Endangered Species Act of 1984, Fish and Game Code, §2050 through §2098.	Protects California's endangered and threatened species.	CDFG	Comments as cooperating agency on Section 7 or Issues 2081 incidental take permit for state-listed species.	The District will avoid endangered and threatened species impacts to the extent possible. If necessary, the District will obtain permit. Section 8.2.4.2
Title 14, California Code of Regulations (CCR) §§670.2 and 670.5.	Lists plants and animals of California declared to be threatened or endangered.	CDFG	N/A	
Fish and Game Code Fully Protected Species. §3511: Fully Protected birds §4700: Fully Protected mammals §5050: Fully Protected reptiles and amphibians §5515: Fully Protected fishes	Prohibits the taking of listed plants and animals that are Fully Protected in California.	CDFG	N/A	The District will avoid take of listed plants and animals. Section 8.2.4.2
Fish and Game Code §1930, Significant Natural Areas(SNA)	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitats. Listed in the CNDDB.	CDFG		The District will avoid impacts to SNA. Section 8.2.4.2
Fish and Game Code §1580, Designated Ecological Reserves	The CDFG commission designates land and water areas as significant wildlife habitats to be preserved in natural condition for the general public to observe and study.	CDFG		The District will avoid impacts to wildlife habitats Section 8.2.4.2

**TABLE 8.2-1**  
**Laws, Ordinances, and Regulations Applicable to CPP Biological Resources**

<b>LORS</b>	<b>Purpose</b>	<b>Regulating Agency</b>	<b>Permit or Approval</b>	<b>AFC Conformance and Applicability</b>
Fish and Game Code §1600, Streambed Alteration Agreement	Reviews projects for on waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.	CDFG	Issues conditions of the Streambed Alteration Agreement that reduces and minimizes effects on vegetation and wildlife.	The District will apply for SAA to alter tributaries to Clay Creek and to HDD under Cosumnes River, Badger Creek and Laguna Creek. Section 8.2.4.2
Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq.	Designates state rare and endangered plants and provides specific protection measures for identified populations.	CDFG	Reviews mitigation options if there will be significant project effects on threatened or endangered plant species.	No rare or endangered plants on project site. Section 8.2.3.2
Public Resource Code §§25500 & 25527.	Siting of facilities in certain areas of critical concern for biological resources, such as ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value, is prohibited, or when none alternative, strict criteria is applied.	USFWS CDFG	Issues Biological Opinion or Authorization with Conditions after review of project impacts.	No areas of critical biological concern in area. Section 8.2.4.2
Title 20 CCR §§1702 (q) and (v); and	Protects "areas of critical concern" and "species of special concern" identified by local, state, or federal resource agencies within the project area, including the CNPS.	USFWS CDFG	Issues Biological Opinion or Authorization with Conditions after review of project impacts.	No areas of critical concern in area. Section 8.2.4.2
Title 14 CCR Section 15000 et seq.	Describes the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site.	USFWS CDFG	Review and comment on AFC.	AFC will provide this information. Section 8.2.4.2

**TABLE 8.2-1**  
**Laws, Ordinances, and Regulations Applicable to CPP Biological Resources**

LORS	Purpose	Regulating Agency	Permit or Approval	AFC Conformance and Applicability
40 CFR 122 <i>et seq.</i> NPDES Discharge Requirements	Authorizes discharges of wastewater to surface water. Authority is delegated to RWQCB in California.	USEPA, delegated to RWQCB	RWQCB reviews permit application, and issues Waste Discharge Requirements (WDRs) and conditions that will be protective of beneficial uses, including biological resources.	The District will obtain NPDES permit to discharge wastewater to Clay Creek. NPDES permit will specify concentration limits, conditions and monitoring requirements to protect beneficial uses by aquatic life.  Section 8.2.4.2

TABLE 8.2-2

Sacramento County General Plan, Conservation Element

Element	Goal/Policy	Conformance
<p><b>Sacramento County General Plan Conservation Element</b></p>	<p>CO-62 Ensure no net loss of marsh and riparian woodland acreage, values, or functions.</p>	<p>The project would conform by using HDD to bore under potentially affected marsh and riparian habitats.</p>
	<p>CO-64 Seasonal and permanent marshland within designated natural preserves shall not be drained or filled for the purpose of converting the land to another use.</p>	<p>The project would conform by using HDD to bore under potentially affected marsh and riparian habitats.</p>
	<p>CO-66 Encroachment within the designated floodway of Sacramento waterways shall be consistent with policies to protect marsh and riparian areas.</p>	<p>The project would not encroach on the 100-year floodplain.</p>
	<p>CO-78 Focus vernal pool preservation in permanent open space areas beyond the Urban Area.</p>	<p>Vernal pool mitigation would be located in a large complex of vernal pools east of Rancho Seco in the non-urban area.</p>
	<p>CO-69 Review projects for potential to restore marsh/riparian woodlands, considering effects on vernal pools, groundwater, flooding, and proposed fill or removal of marsh and riparian habitat.</p>	<p>The project would avoid all impacts to marsh and riparian woodlands.</p>
	<p>CO-70 Public or private projects involving filling or removal of marsh/riparian habitat shall be mitigated outside of natural preserves where on-site mitigation is not desirable or appropriate shall be mitigated through the purchase of mitigation credits for restored wetlands/riparian areas at no net loss.</p>	<p>The project would avoid all impacts to marsh and riparian woodlands.</p>
	<p>CO-83 Ensure no net loss of vernal pool acreage, and/or values and functions and mitigate any loss in relation to the values of quality of habitat.</p>	<p>The District would compensate at a minimum of 1:1 for all vernal pool loss, to meet the "no-net-loss" policy.</p>
	<p>CO-84 Evaluate feasible on-site alternatives in the environmental review process that reduce impacts on vernal pools and provide effective on-site preservation in terms of minimum management requirements, effective size, and evaluation criteria identified in the report "Sacramento County Vernal Pools" (1990).</p>	<p>The District will consider all feasible on-site alternatives to avoid or reduce impacts to vernal pools.</p>
	<p>CO-85 Require in-kind compensation for the type and functional values of vernal pools eliminated by development.</p>	<p>The District would compensate at a minimum of 1:1 for all vernal pool loss, to meet the "no-net-loss" policy.</p>

**TABLE 8.2-2**

**Sacramento County General Plan, Conservation Element**

Element	Goal/Policy	Conformance
<p>CO-86 When on-site preservation or mitigation is not feasible or is undesirable; require off-site mitigation at County-approved mitigation banks within Sacramento County.</p>	<p>The District would mitigate vernal pool impacts at the Rancho Seco site, in Sacramento County.</p>	
<p>CO-87 Mitigation for vernal pool loss shall be considered in the environmental review process, and mitigation shall be required based on information contained within the environmental documents on the quality of those resources and their ability to be sustained within an urban setting.</p>	<p>This AFC considers and evaluates all potential adverse impacts to vernal pools, and describes relevant mitigation.</p>	
<p>CO-90 Prioritize creation of mitigation banks in areas where sites suitable for creating new vernal pools exist in close proximity to existing vernal pools.</p>	<p>Rancho Seco has numerous opportunities for additional vernal pool creation.</p>	
<p>CO-95 Until such time as mitigation credits consistent with the above policies are available, development entitlements involving filling or removal of vernal pools may be granted provided that the District:</p>	<p>It is the intention of the District that the Rancho Seco mitigation area would comprise all these criteria.</p>	
<ul style="list-style-type: none"> <li>a) Purchase and dedicate the development rights for a vernal pool preserve, within a General Plan designated Resource Conservation Area, the extent of which shall not be less than the acreage of vernal pool and upland watershed necessary to sustain the viability of the pools that are proposed to be developed, and, which, in conjunction with adjoining planned vernal pool preserves, will provide a long-term, ecologically viable preserve.</li> <li>b) Prepare a mitigation and management plan for the preserve area consistent with policies of this section.</li> <li>c) Enter into long-term agreement with an agency or organization qualified to create, manage, and monitor vernal pools.</li> <li>d) Post bond guaranteeing the management funding for a minimum of 50 years.</li> <li>e) Obtains permission from the U.S. Army Corps of Engineers.</li> <li>f) Demonstrate that no rare, threatened, or endangered species occur on the site.</li> </ul>		

**TABLE 8.2-2**

**Sacramento County General Plan, Conservation Element**

Element	Goal/Policy	Conformance
<p>CO-96 Prior to adoption of the mitigation banking ordinance, utilized on a countywide basis, the adopted interim wetland mitigation/compensated for by either one or a combination of the following methods:</p> <ul style="list-style-type: none"> <li>a) Preserve or create wetlands sufficient to result in no net loss of wetland acreage, and protect their required watersheds as is necessary for the continued function of wetlands on the project site. The appropriate hearing body shall determine that project design, configuration, and wetland management plan, provide reasonable assurances that the wetlands will be protected and their long-term ecological health maintained.</li> <li>b) Where a Section 404 Permit has been issued by the Corps of Engineers, or an application has been made to obtain a Section 404 Permit, the Mitigation and Management Plan required by that permit or proposed to satisfy the requirements of the Corps for granting a permit may be submitted for purposes of satisfying Paragraph 1, provided a no-net loss of wetlands is achieved and, provided further, that such mitigation and management plan shall be subject to the independent, discretionary approval of the Board of Supervisors.</li> <li>c) Pay to the County of Sacramento an amount based on a rate of \$35,000 per acre for the unmitigated/uncompensated wetlands, which shall constitute mitigation for purposes of implementing adopted no-net loss policies and CEQA required mitigation. The payment shall be collected by the Department of Planning and Community Development at the time of Improvement plan or Building Permit approval, whichever occurs earlier, and deposited into the Wetlands Restoration Trust Fund.</li> </ul>	<p>The District would compensate for any wetland loss through the Section 404 permit process and remain mindful of the County Policy with respect to minimum criteria.</p>	
<p>CO-99 Ensure that minimum management requirements for vernal pool preserves and mitigation banks include protection in perpetuity through acquisition of fee title or a permanent conservation easement; a funding source for long-term operation, maintenance, and management; preparation and implementation of a management plan; and establishment of an interagency oversight committee.</p>	<p>The District would use a mitigation bank that complies with these policies.</p>	

**TABLE 8.2-2**

**Sacramento County General Plan, Conservation Element**

Element	Goal/Policy	Conformance
	<p>CO-100 The price of mitigation credits offered for sale to compensate for vernal pool losses shall incorporate estimated management costs for a minimum of 50 years.</p>	<p>The District would use a mitigation bank that complies with these policies.</p>
	<p>CO-102 The County will provide information to applicants with projects in potential wetland areas and provide coordination assistance with the Army Corps of Engineers in order to facilitate the development review and Section 404 Permit review processes.</p>	<p>The District appreciates that assistance of the county in achieving compliance with the 404 permit process.</p>
	<p>CO-107 To the maximum extent practical, retain topographic diversity and variation when channels are realigned, or modified, including maintaining meandering characteristics, varied berm width, naturalized side slope, and varied channel bottom elevation.</p>	<p>The District proposed to fill and relocate up to 3 tributaries to Clay Creek East, and will avoid channeling or culverting the new tributaries so that they can attain the natural meandering and varied slopes characteristic of natural channels.</p>
	<p>CO-110 Channel modifications shall not prevent minimum water flows necessary to protect and enhance fish habitats, native riparian vegetation, water quality, or groundwater recharge.</p>	<p>The District will at minimum maintain existing flow capacities in affected waterways.</p>
	<p>CO-112 Channel modifications shall retain marsh and riparian vegetation whenever possible or otherwise recreate the natural stream channel consistent with the ecological integrity of the preexisting stream. Modifications resulting in wetland or riparian loss shall be mitigated.</p>	<p>The District will retain ecological integrity of existing streambeds in project area by allowing or facilitating the natural colonization of the channel.</p>
	<p>CO-117 Provide a transition zone adjacent to stream corridors which incorporates:</p> <ol style="list-style-type: none"> <li>1. A buffer zone on each side of the stream, between the outer edge of any existing or planned riparian or wetland vegetation and more intensive uses.</li> <li>2. The transition zone for stream corridors shall provide sufficient width to allow a minimum 50- to 150-foot natural buffer, a 20-foot mowed fire break at the outer edge, sufficient additional width to provide for access for channel maintenance and flood control, and for planned passive recreation uses.</li> </ol>	<p>There is no riparian or marsh vegetation affected on the project site. The restored stream will have a minimum 25-foot-wide buffer between paved areas and the tributary channel, which is consistent with the relatively abrupt transition that is present in the natural condition.</p>

**TABLE 8.2-2**

**Sacramento County General Plan, Conservation Element**

Element	Goal/Policy	Conformance
3.	<p>The width of the natural buffers shall be based on:</p> <ul style="list-style-type: none"> <li>- Quality and quantity of existing and planned habitat</li> <li>- Presence of species as well as species sensitivity to human disturbance</li> <li>- Areas for regeneration of vegetation</li> <li>- Corridor for wildlife habitat linkage</li> <li>- Nature of planned urban uses adjacent to the corridor</li> <li>- Need for community greenways</li> <li>- The effective use of active barriers</li> </ul>	
4.	<p>The transition zone shall not include containment ponds or other features implementing pollutant discharge requirements.</p>	
5.	<p>Master drainage plans may provide for other standards that meet the intent of this policy.</p>	
	<p>CO-114 Encourage revegetation of native plant species and avoid non-indigenous species.</p>	<p>The District will facilitate the reestablishment of native species by salvaging topsoil and seedbank from affected areas and using this to line the relocated channel.</p>
	<p>CO-116 Where there is extensive existing riparian vegetation, consider construction of secondary flood control channels for flood control purposes.</p>	<p>There is no extensive riparian vegetation present on the affected project site.</p>
	<p>CO-130 Make every effort to protect and preserve non-oak native, excluding cottonwoods, and landmark trees and protect and preserve native oak trees measuring 6 inches in diameter at 4.5 feet above ground in urban and rural areas, excluding parcels zoned exclusively for agriculture.</p>	<p>Construction on the project site and along the gas supply line will avoid the removal of mature trees.</p>

**TABLE 8.2-2**

**Sacramento County General Plan, Conservation Element**

Element	Goal/Policy	Conformance
<p>CO-131 Native trees other than oaks, which cannot be protected, shall be replaced with in-kind species in accordance with established tree planting specifications, the combined diameter of which shall equal the combined diameter of the trees removed. In addition, with respect to oaks, a provision for a comparable on-site area for the propagation of oak trees may substitute for replacement tree planting requirements at the discretion of the County Tree Coordinator when removal of a mature oak tree is necessary in accordance with consistent policy.</p>	<p>Construction on the project site and along the gas supply line will avoid the removal of mature trees. Any native trees, which cannot be avoided, shall be replaced by a minimum 1:1 "inch-for-inch" ratio of the same or similar trees in consultation with the County Tree Coordinator.</p>	
<p>CO-143 Control human access to critical habitat areas on public lands to minimize impact upon and disturbance of threatened and endangered species.</p>	<p>The anticipated vernal pool mitigation area is fenced and gated to control access.</p>	

Source: Sacramento County General Plan (1997).

**TABLE 8.2-3**  
**Special-Status Species Potentially Occurring in CPP Project Area**

Common Name	Scientific Name <sup>1</sup>	Status <sup>2</sup> (Fed/CA)	Season <sup>3</sup>	Primary Habitat <sup>4</sup>	Observed <sup>5</sup>	Comments
<b>Plants</b>						
Legenere	<i>Legenere limosa</i>	--/1B	May-June	Vernal Pools	R	Known from 0.5 miles ESE of south end of Rancho Seco Dam
Boggs Lake Hedge-Hyssop	<i>Gratiola heterosepala</i>	--/E	April-June	Marshes, swamps, and vernal pools	R	Multiple occurrences in Forster Ranch, in San Joaquin County
Sacramento Orcutt Grass	<i>Orcuttia viscida</i>	E/E	May-June	Vernal Pools	R	Reported to occur southeast of Rancho Seco Dam
lone manzanita	<i>Arctostaphylos myrtifolia</i>	T/T	January-February	lone formation soils in chaparral, cismontane woodland from 120 to 1800 feet	U	No suitable habitat in the project area
Dwarf downingia	<i>Downingia pusilla</i>		March-May	Vernal pools and swales in grasslands and foothills; blooms	U	Moderate potential for occurrence; not found in the project area
lone buckwheat	<i>Eriogonum apicum</i> var. <i>apicum</i>	E/E	July-October	lone soils in openings in chaparral from 180 to 450 feet	U	No suitable habitat in the project area
Irish Hill buckwheat	<i>Eriogonum apicum</i> var. <i>prostratum</i>	E/E	June-July	Openings in chaparral on lone soils from 270 to 390 feet	U	No suitable habitat in the project area
Tuolumne button-celery	<i>Eryngium pinnatisectum</i>	FSC	June-August	Vernal pools and mesic sites within cismontane woodland and lower montane coniferous forest from 210 to 2800 feet	U	No suitable habitat in the project area
Bisbee Peak rush-rose	<i>Helianthemum suffrutescens</i>	--/3	April-June	Serpentinite, gabbroic, or lone soils in chaparral from 120 to 2,500 feet	U	No suitable habitat in the project area
Rose-mallow	<i>Hibiscus lasiocarpus</i>	--/2	June-September	Freshwater marshes and swamps	U	No suitable habitat; not found in the project area
Parry's horkelia	<i>Horkelia parryi</i>	FSC	April-June	lone formation soils in chaparral or cismontane woodland from 240 to 3,000 feet	U	No suitable habitat in the project area

**TABLE 8.2-3**  
Special-Status Species Potentially Occurring in CPP Project Area

Common Name	Scientific Name <sup>1</sup>	Status <sup>2</sup> (Fed/CA)	Season <sup>3</sup>	Primary Habitat <sup>4</sup>	Observed <sup>5</sup>	Comments
Delta tule pea	<i>Lathyrus jepsonii</i> var <i>jepsonii</i>	FSC	May- September	Coastal freshwater marshes from 0 to 12 feet; blooms	U	Moderate potential for occurrence; known from the confluence of Badger Creek and the Consumnes River. Not found in the project area
Mason's lilaepsis	<i>Lilaeopsis masonii</i>	FSC/CR	April- November	Brackish or freshwater marshes and riparian scrub from 0 to 30 feet	U	No suitable habitat; not found in the project area
Pincushion navaretia	<i>Navaretia myersii</i> ssp. <i>Meyersii</i>	--/1B	May	Vernal pools from 20 to 270 feet	R	Known from the Badger Creek vicinity. Not found in the project area
Slender Orcutt grass	<i>Orcuttia tenuis</i>	FT/CE	Blooms from May-October	Vernal pools from 90 to 5,000 feet	R	Known from Laguna Creek. Not found in the project area
Sanford's arrowhead	<i>Sagittaria sanfordii</i>	FSC	May-October	Shallow freshwater marshes and swamps	U	May occur in farm ponds or wetlands. No suitable habitat on the project site
<b>Insects and Crustacea</b>						
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	T/--	Resident	Vernal pools and ephemeral swales	R	Known to occur in vernal pools east of site
California linderiella	<i>Linderiella californica</i>	--/--	Resident	Vernal pools and ephemeral swales	R	Known to occur in vernal pools east of site
Vernal Pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	Resident	Vernal pools and ephemeral swales	R	Present. Found in Pool #29. Suitable habitat identified in other pools throughout the survey area
<b>Mammals</b>						
None						
<b>Reptiles and Amphibians</b>						
California tiger salamander	<i>Ambystoma californiense</i>	C/SC	Resident	Ephemeral ponds and vernal pools	U	Site lacks any suitable ponds for breeding salamanders

**TABLE 8.2-3**  
Special-Status Species Potentially Occurring in CPP Project Area

Common Name	Scientific Name <sup>1</sup>	Status <sup>2</sup> (Fed/CA)	Season <sup>3</sup>	Primary Habitat <sup>4</sup>	Observed <sup>5</sup>	Comments
Northwestern pond turtle	<i>Clemmys marmorata marmorata</i>	FSC/CSC	Resident	Ponds, still pools along creeks and rivers, usually with well-developed riparian vegetation on fringes. Nests in uplands near water	R	Recorded from streams in vicinity and observed in Clay Creek, north of project site
Western spadefoot	<i>Scaphiopus hammodii</i>	CSC	Resident	Primarily grassland habitats. Occasionally in valley-foothill hardwood woodlands	S	Not seen. Suitable habitat identified. Vernal pools and permanent ponds offer breeding habitat. Small mammal burrows found at project area may be used as refuge during the dry season. Moderate to high potential for occurrence
Giant garter snake	<i>Thamnophis gigas</i>	FT/ST	Resident	Ponds and slow moving streams with dense emergent vegetation	S	Occurs in Cosumnes River and tributaries. No dense vegetation on project site to support this species
<b>Birds</b>						
White tailed kite	<i>Elanus leucurus</i>	--/FP	Resident	Nests in trees near open grassy fields	S	Probably forages on project site. No suitable nesting habitat on project site
Burrowing owl	<i>Athene cunicularia</i>	SC/SC	Primarily summer migrant	Nests in former squirrel burrows in short-grass prairie	S	Canal banks near project site may contain suitable habitat for burrowing owls, if squirrels and burrows were present. Species is known from general region. None observed during field surveys
California horned lark	<i>Eremophila alpestris actia</i>	--/SC	Summer migrant	Nests in open grassland prairies	U	Site is highly modified for agricultural development. Unlikely to nest there
Swainson's hawk	<i>Buteo swainsoni</i>	--/T	Primarily summer migrant	Nests in large cottonwoods along riparian corridors	S	Hawks may forage on and adjacent to project site; no suitable nest sites on project site
Golden eagle	<i>Aquila chrysaetos</i>	--/SC	Winter and Summer	Builds large platform nest in large trees or lattice transmission line	R	Nest site reported in 1992, 5 miles ENE of Rancho Seco

**TABLE 8.2-3**  
**Special-Status Species Potentially Occurring in CPP Project Area**

Common Name	Scientific Name <sup>1</sup>	Status <sup>2</sup> (Fed/CA)	Season <sup>3</sup>	Primary Habitat <sup>4</sup>	Observed <sup>5</sup>	Comments
Cooper's hawk	<i>Accipiter cooperii</i>	--/SC	Winter and Summer	towers Nests in oak woodlands and conifer forests. Most common in live oak	U	Not seen. Low potential for occurrence
Tricolored backbird	<i>Agelaius tricolor</i>	SC/SC	Summer migrant	Cattail or tule marshes; Forages in fields, farms	S	Habitat suitable for foraging. Suitable nesting habitat exists in riparian shrubs on south side of project site. None seen during field surveys
Loggerhead shrike	<i>Lanius ludovicianus</i>	--/SC	S	Open habitats with sparse shrubs and trees. Uses perches such as trees, fences, and power lines to scan for prey	O	Loggerhead shrikes are present in the project vicinity
Double-crested cormorant	<i>Phalacrocorax auritus</i>	--/SC	Summer	Coast, inland lakes, fresh, salt, and estuarine waters. Lacustrine and riverine habitats in Central Valley	O	Occasionally present in Rancho Seco Reservoir, and common along Cosumnes and Laguna Creeks
Bank swallow	<i>Riparia riparia</i>	ST	Summer	Colonial breeder in vertical banks, usually close to water. Requires soft substrate for excavation	U	Not seen. Not expected to occur in project area

**NOTES:**

<sup>1</sup>Scientific names are based on the following sources: AOU, 1983; Jennings, 1983; Zeiner et al. 1990.

<sup>2</sup>Status of species relative to the Federal and California State Endangered Species Acts and Fish and Game Code.

<sup>3</sup>Season Blooming period for plants. Season of use by animals.

<sup>4</sup>Primary Habitat Most likely habitat association.

<sup>5</sup>Present on site.

C Candidate for listing as federal threatened or endangered threatened. Proposed rules have not yet been issued because they have been precluded at present by other listing activity.

CA California status.

CNPS California Native Plant Society Listing (does not apply to wildlife species).

E Federally listed as endangered.

E Species whose continued existence in California is jeopardized.

Fed Federal Status.

FP Fully protected against take pursuant to the Fish and Game Code Section 3503.5.

IB Plants, rare, threatened, or endangered in California and elsewhere and are rare throughout their range. According to CNPS, all of the plants constituting List 1B meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection) of the California Department of Fish and Game Code and are eligible for state listing.

**TABLE 8.2-3**  
**Special-Status Species Potentially Occurring in CPP Project Area**

	<b>Common Name</b>	<b>Scientific Name<sup>1</sup></b>	<b>Status<sup>2</sup> (Fed/CA)</b>	<b>Season<sup>3</sup></b>	<b>Primary Habitat<sup>4</sup></b>	<b>Observed<sup>5</sup></b>	<b>Comments</b>
PE							Proposed endangered.
PT							Proposed threatened.
SC							Species of Special Concern threatened. Proposed rules have not yet been issued because they have been precluded at present by other listing activity.
SC							California Department of Fish and Game "Species of Special Concern." Species with declining populations in California.
T							Federally listed as threatened.
T							Species that, although not presently threatened in California with extinction, is likely to become endangered in the foreseeable future.
--							No California or federal status.
O							Observed on site.
R							Recorded on site.
S							Suitable habitat on site.
U							Unsuitable habitat on site.

SOURCE: California Department of Fish and Game, *California Natural Diversity Database*, 2001; California Native Plant Society, *Inventory of Rare and Endangered Vascular Plants Of California*, Feb. 1994.

**TABLE 8.2-4**

**Summary of Permanent and Temporary CPP Project Impacts on Biological Resources During Construction**

Location	Project Work	Construction Zone Size	Time Requirements	Habitat Type	Sensitive Biological Resources	Impacts	
						Temporary	Permanent
Power Plant Site	Grading for footprint construction	30 acres	Start summer of 2002	Pasture/ annual grassland, seasonal swale, seasonal marsh, vernal pool	Vernal pool fairy shrimp  Plants in wetlands	None. All of site would be converted from habitat	Potential loss of 30 acres of annual grassland habitat. Relocation of 2,800 feet of seasonal swale and seasonal marsh. Elimination of < 0.01 acre of vernal pool habitat (VP9)
Access road	Grading and pavement for road	None in addition to power plant construction area	Summer 2002	None	None	None	None
Stormwater detention pond	Grade berms into place surrounding detention pond	1.5 acres, approximately 560 ft. x 160 ft.	Summer 2002	Pasture/ annual grassland,	Seasonal swale	Clear and grade 2 acres of vegetation, expected to recover to annual grassland. Potential sedimentation to creek during construction	Approximately 0.5 acre of habitat would be permanently converted from annual grassland to berms surrounding detention pond
Construction laydown area, south of Clay East Road	Construct compacted gravel pad	20 acres	Summer 2002	Pasture/ annual grassland	None	Grading and compaction of up to 20 acres	None. Laydown area would be restored to pre-construction conditions
Natural gas pipeline from Carson	Gas pipeline trench	26-miles of trench. 75' construction right of way, 25' permanent	Summer 2002	Road, railroad berm, pasture, annual	Vernal pools, Swainson's hawk, wetlands, Cosumnes	Disturbance of 240 acres of various	Loss of 45 acres of agricultural fields

**TABLE 8.2-4**  
**Summary of Permanent and Temporary CPP Project Impacts on Biological Resources During Construction**

Location	Project Work	Construction Zone Size	Time Requirements	Habitat Type	Sensitive Biological Resources	Impacts	
						Temporary	Permanent
Cogen to project site.		easement		grassland, vineyard	River, Laguna Creek, Badger Creek	habitat	
Water supply line	Pipeline trench	800-foot pipeline routed south from Rancho Seco Plant to site. 75-foot-wide construction easement, no permanent corridor	Summer 2002	Pasture, annual grassland, vernal pools	Vernal pool species, wetlands	Disturbance of 1.3 acres of disturbed grasslands	None. Pipeline area would be restored to pre-construction conditions
Wastewater discharge	Pipeline trench	200 feet long to Clay Creek. 75-foot-wide construction easement, 25-foot-wide permanent disturbance at outfall.	Summer 2003	Pasture, annual grassland, seasonal swale	Vernal pools, sedimentation to surface waters	Disturbance of 0.3 acres of disturbed grasslands	Conversion of < 0.2 acres for outfall structure to Clay Creek
Transmission towers	Transmission tower footings, construction and maintenance	800 feet long from CPP to Rancho Seco Plant. 75-foot-wide construction easement, 25-foot-wide permanent easement.	Summer 2003	Pasture, annual grassland, seasonal swale	Vernal pools, sedimentation to surface waters	Disturbance of 0.3 acres of disturbed grasslands	Conversion of 1.0 acres for transmission tower footings

**TABLE 8.2-4**  
**Summary of Permanent and Temporary CPP Project Impacts on Biological Resources During Construction**

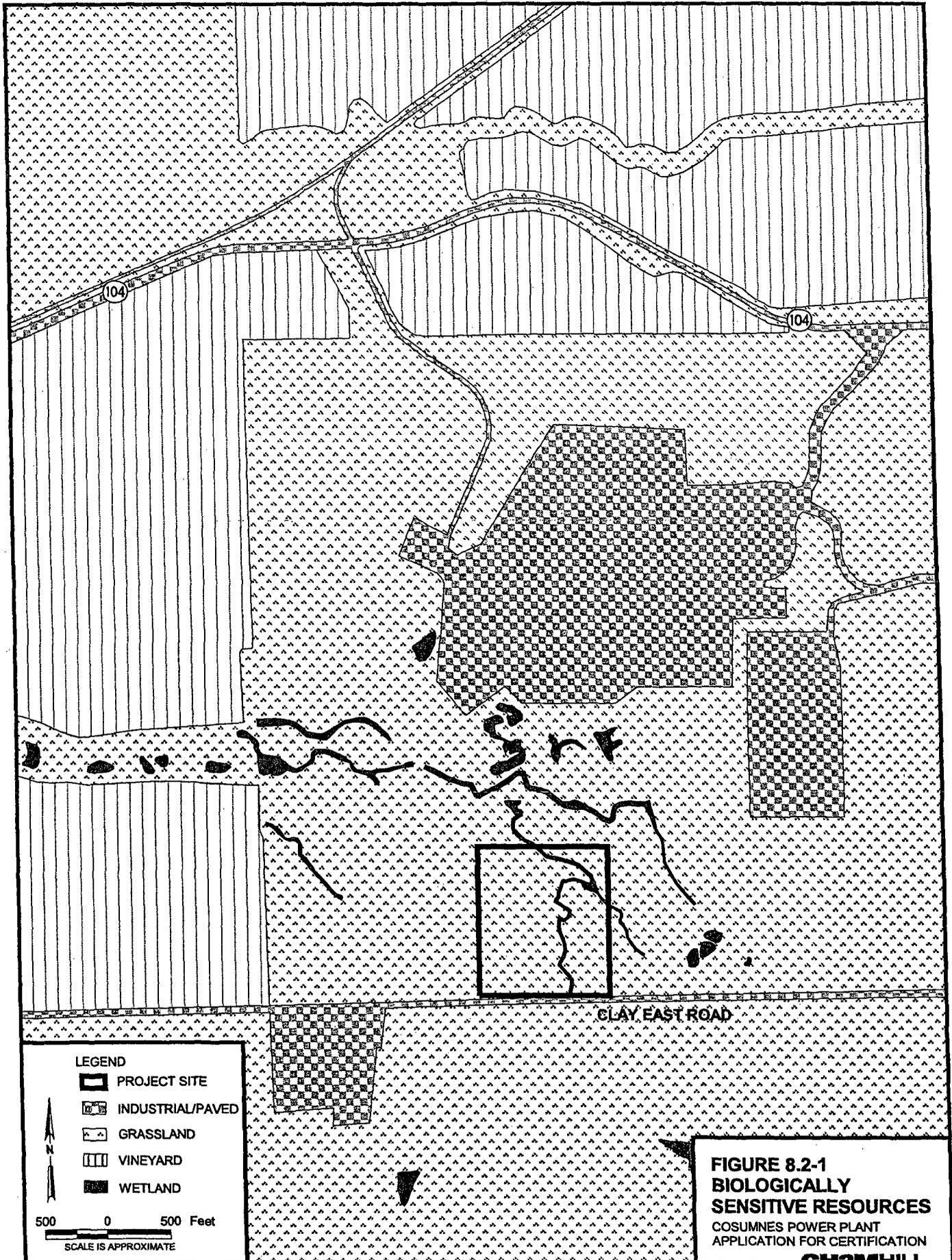
Location	Project Work	Construction Zone Size	Time Requirements	Habitat Type	Sensitive Biological Resources	Impacts	
						Temporary	Permanent
Emergency/ Fire Water Supply Line	Pipeline trench	200 feet long to Clay Creek. 75-foot-wide construction easement, 25-foot-wide permanent disturbance at outfall.	Summer 2003	Pasture, annual grassland, seasonal swale	Vernal pools, sedimentation to surface waters	Disturbance of 0.3 acres of disturbed grasslands	Conversion of < 0.2 acres for outfall structure to Clay Creek
Project site and along pipeline	Water disposal for dust control and pipeline testing	Project site (30 acres), laydown area (20 acres), pipeline corridor (40 acres)	Summer 2003	Graded annual grassland, agricultural or roadside berms	Erosion/ Sedimentation to surface waters. Disposal of pipeline test water	Length of pipeline and project site during construction	None

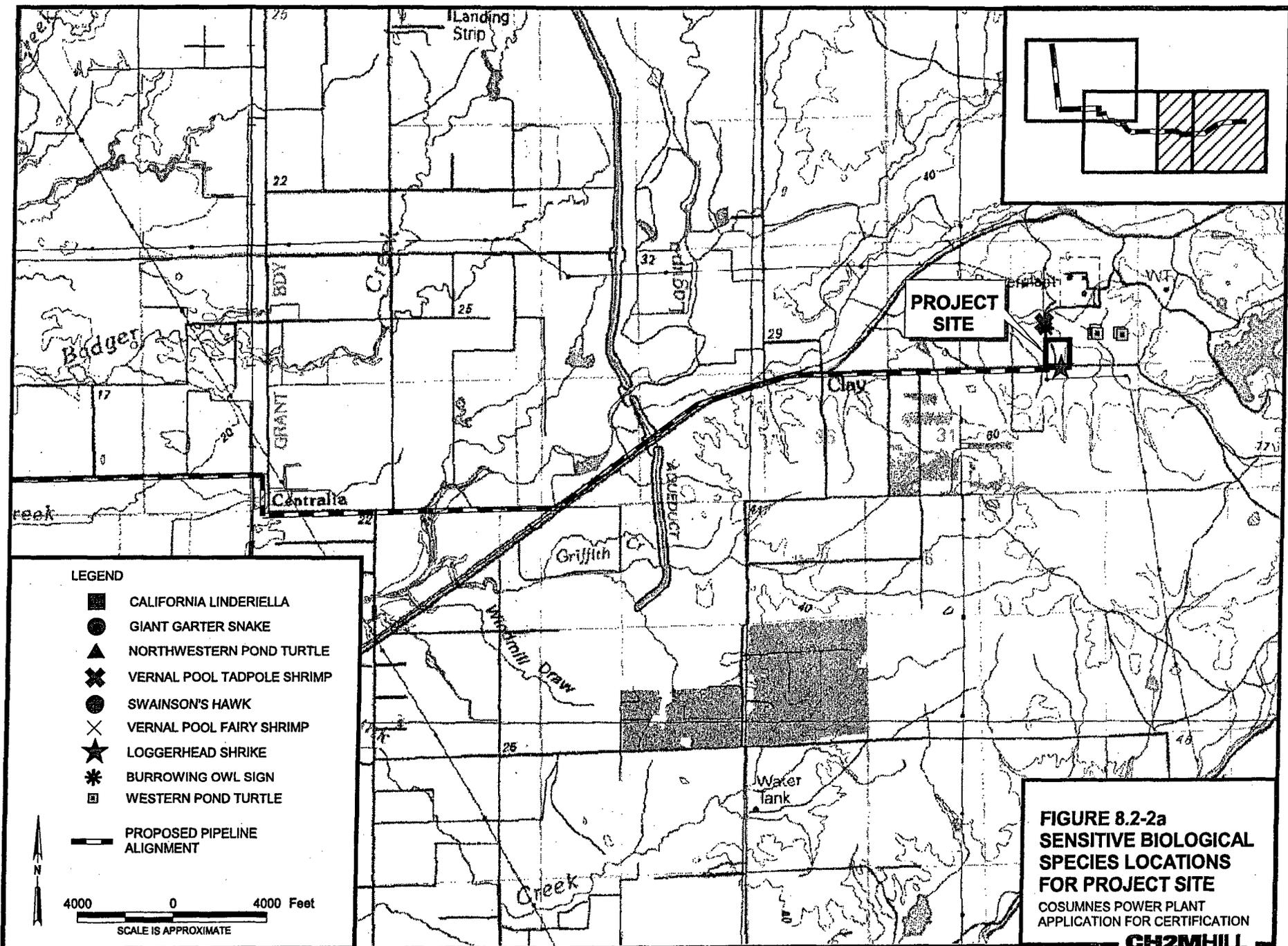
**TABLE 8.2-5**  
Contacts for the CPP Project

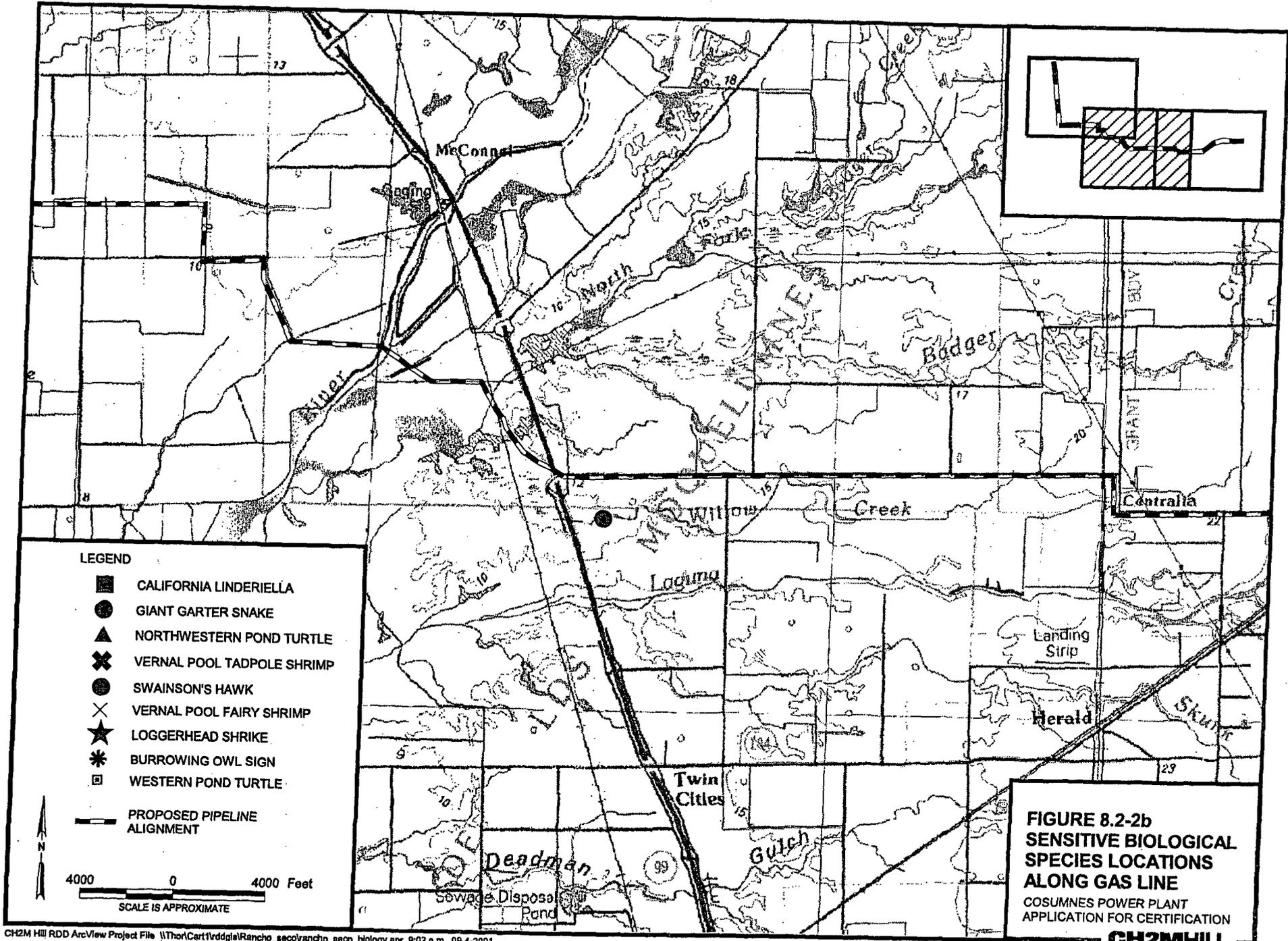
<b>Biological Resource Agency</b>	<b>Person Contacted</b>	<b>Issue</b>	<b>Phone</b>
U.S. Fish and Wildlife Service	Ken Sanchez	Federal threatened or endangered species	(916) 414-6600
California Department of Fish and Game	Terry Roscoe	California threatened or endangered species	(916) 358-2883
California Department of Fish and Game	Gary Hobgood	Streambed Alteration Agreement	(916) 983-5162
U.S. Army Corps of Engineers	Justin Cutler	Waters of the U.S. and wetland impacts	(916) 557-5258
Cosumnes River Preserve Manager, Nature Conservancy	Rick Cooper	Requirements for crossing the Cosumnes River Preserve	(916) 683-1701

**TABLE 8.2-6**  
Permits and Schedule

<b>Permit/Authorization</b>	<b>Requirements to Complete Consultations</b>	<b>Date Application Submitted</b>
USFWS Section 7 Endangered Species Authorization for take of fairy shrimp.	USFWS to issue Biological Opinion, in support of potential adverse impacts to fairy shrimp	January 2002
CDFG Streambed Alteration Agreement potentially required for pipeline construction over irrigation canals	Gas pipeline crosses irrigation canals that may be interpreted to have "bed and banks" and require permit from CDFG. Consult with CDFG, and, if needed, prepare application that clearly identifies areas of impact and measures to protect vegetation and wildlife downstream of construction	April 2002
Clean Water Act Section 404 Permit potentially required for gas pipeline crossing of irrigation ditches	If construction affects jurisdictional wetlands, implement pre-notification and construction in compliance with Nationwide Section 404 authorization	April 2002
Water Quality Certification	Prepare application that describes monitoring plan for water quality of stormwater discharge; requires completed endangered species consultations and CDFG streambed alteration agreement	April 2002

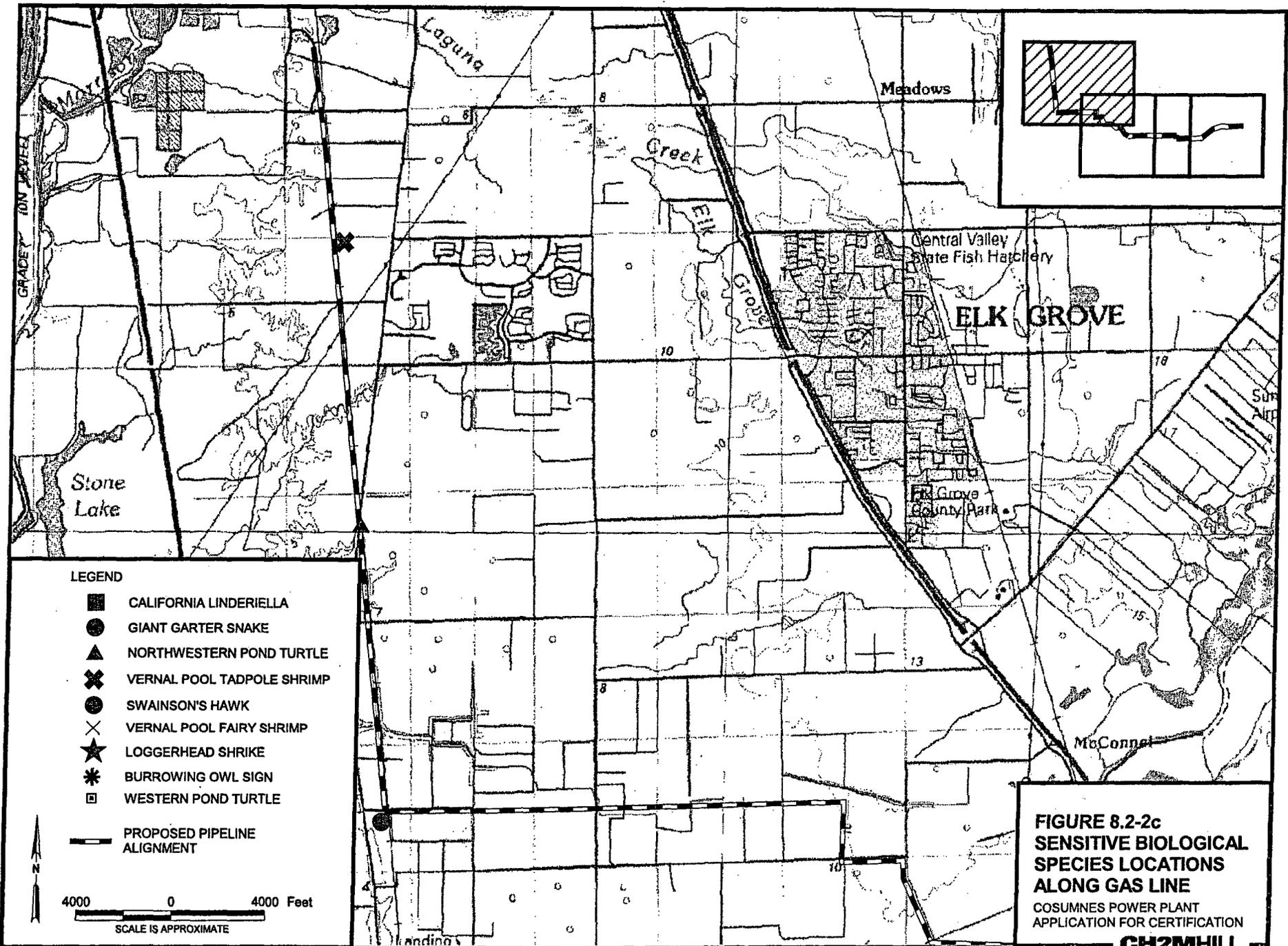






**FIGURE 8.2-2b**  
**SENSITIVE BIOLOGICAL**  
**SPECIES LOCATIONS**  
**ALONG GAS LINE**  
 COSUMNES POWER PLANT  
 APPLICATION FOR CERTIFICATION

**CH2MHILL**



## 8.3 Cultural Resources

This section determines whether cultural resources are present and could be affected adversely by the CPP project. The significance of any potentially affected resources is assessed, and measures are proposed to mitigate potential adverse project effects. This study was conducted by Dr. James C. Bard and Mr. Jim Sharpe, M.S. (CH2M HILL Cultural Resource Specialists who meet the *Standards and Guidelines for Archaeology and Historic Preservation* National Park Service, 1983) with the assistance of Ms. Alicia Bergstad, B.S. (CH2M HILL Cultural Resource Specialist).

This section is consistent with both federal and state regulatory requirements for cultural resources pursuant to Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966 (as amended) (16 USC 470f) and its implementing regulations 36 CFR Part 800 and the California Environmental Quality Act (CEQA). The study scope was developed in consultation with the CEC's cultural resources staff and complies with *Instructions to the California Energy Commission Staff for the Review of and Information Requirements for an Application for Certification* (CEC, 1992) and *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 1997).

Cultural resources include prehistoric and historic archaeological sites;<sup>1</sup> districts and objects; standing historic structures, buildings, districts and objects; and, locations of important historic events, or sites of traditional/cultural importance to various groups.<sup>2</sup>

Section 8.3.1 discusses the LORS applicable to the protection of cultural resources. Section 8.3.2 describes the cultural resources environment that might be affected by CPP. Section 8.3.3 discusses the environmental consequences of construction of the proposed

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<sup>1</sup> "Site" - "the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure . . . where the location itself possesses historic, cultural, or archeological value" (USNPS-IRD 1991:15).

<sup>2</sup> The "federal" definitions of *cultural resource*, *historic property* or *historic resource*, *traditional use area*, *sacred resources* are reviewed below and are typically applied to non-federal projects.

A *cultural resource* may be defined as a phenomenon associated with prehistory, historical events or individuals or extant cultural systems. These include archaeological sites, districts and objects; standing historic structures, districts and objects; locations of important historic events; and, places, objects and living or non-living things that are important to the practice and continuity of traditional cultures. Cultural resources may involve *historic properties*, *traditional use areas* and *sacred resource areas*.

*Historic property* or *historic resource* means any prehistoric district, site building, structure or object included in, or eligible for, inclusion in the National Register of Historic Places. The definition also includes artifacts, records and remains that are related to such a district, site, building, structure or object.

*Traditional use area* refers to an area or landscape identified by a cultural group to be necessary for the perpetuation of the traditional culture. The concept can include areas for the collection of food and non-food resources, occupation sites and ceremonial and/or sacred areas.

*Sacred resources* applies to traditional sites, places or objects that Native American tribes or groups, or their members, perceive as having religious significance.

development. Section 8.3.4 determines whether there are any cumulative effects from the project. Section 8.3.5 presents mitigation measures that will be implemented to avoid construction impacts. Section 8.3.6 lists the agencies involved and agency contacts, and Section 8.3.7 discusses permits and the permitting schedule. Section 8.3.8 provides a list of reference materials used in preparing this section.

If possible, all recorded cultural resources will be avoided by CPP. However, if avoidance is not possible through project redesign, the significance of the affected resources will be evaluated formally using appropriate federal and/or state and local cultural resource significance evaluation criteria and guidelines. If a resource is determined to be significant, a data recovery program or some other appropriate mitigative effort will be undertaken in consultation with the CEC.

The CPP project is subject to CEC and CEQA permitting requirements. If the project becomes subject to federal agency involvement (permitting, licensing, etc.), additional authorities related to cultural resources may be triggered, including the National Environmental Policy Act and the Archaeological and Historic Preservation Act (AHPA) of 1974 (16 USC 469), among others. The AHPA includes requirements to coordinate with the Secretary of the Interior for notification, data recovery, protection, and/or preservation when a federally licensed project may cause the irreparable loss or destruction of significant scientific, prehistoric, historic, or archaeological data. In 1983, the Secretary of the Interior established standards for gathering and treating data related to cultural resources in *Standards and Guidelines for Archaeology and Historic Preservation*.

### 8.3.1 Laws, Ordinances, Regulations, and Standards

A summary of applicable LORS is provided in Table 8.3-1.

#### 8.3.1.1 Federal LORS

The National Historic Preservation Act of 1966 (as amended) established the federal government's policy on historic preservation and the programs, including the National Register of Historic Places (NRHP), through which that policy is implemented. Under the NHPA, historic properties include "... any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" (16 USC 470w (5)).<sup>3</sup> The NHPA of 1966 (as amended) and its implementing regulations (16 USC 470 et seq., 36 CFR Part 800, 36 CFR Part 60, and 36 CFR Part 63) require the agency(ies) to consider the effect of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation

<sup>3</sup> The National Register criteria for evaluation include: (1) is at least 50 years old; (2) retains integrity of location, design, setting, materials, workmanship, feeling, and association; and (3) has one or all of the following characteristics of association: (a) "... with events that have made a significant contribution to the broad patterns of our history;" (b) "... with the lives of persons significant in our past;" (c) "... that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction;" or, (d) "... have yielded, or may be likely to yield, information important in prehistory or history."

Officer (SHPO) a reasonable opportunity to comment on any undertaking that could adversely affect cultural properties listed or eligible for listing on the NRHP.

**TABLE 8.3-1**  
Applicable Cultural Resources Laws, Ordinances, Regulations, and Standards

Law, Ordinance, Regulation, or Standard	Applicability	Project Conformity?	AFC Reference
CEQA Guidelines	Project construction may encounter archaeological resources	Yes	Section 8.3.1
Health and Safety Code Section 7050.5	Construction may encounter Native American graves, Coroner calls NAHC	Yes	Section 8.3.1
Public Resources Code Section 5097.98	Construction may encounter Native American graves, NAHC assigns Most Likely Descendant	Yes	Section 8.3.1
Public Resources Code Section 5097.5/5097.9	Would apply only if some project land were acquired by the state (currently no state land)	Yes	Section 8.3.1
National Historic Preservation Act	Issuance of a Clean Water Act Section 404 permit is a federal undertaking	Yes	Section 8.3.1
Archaeological Resources Protection Act	Protects archaeological resources from vandalism and unauthorized collecting on federal land	Yes	Section 8.3.1
Native American Graves Protection and Repatriation Act	Assigns ownership of Native American graves on federal land to Native American descendants or culturally affiliated organizations	Yes	Section 8.3.1
Conservation and Public Facilities Elements of the Sacramento General Plan (Dec. 1993 and Aug. 1998)	Sets policies to preserve historically and archaeologically significant structures, sites, districts, and artifacts	Yes	Section 8.3.1

If a Clean Water Act (CWA) Section 404 permit is required for construction (wetland fills or crossings), the NHPA of 1966 (as amended) and its implementing regulations (16 USC 470 et seq., 36 CFR Part 800, 36 CFR Part 60, and 36 CFR Part 63) also apply. The U.S. Army Corps of Engineers (USACE), as lead federal agency for issuing the CWA Section 404 permit, would be the lead agency for NHPA Section 106 compliance and consultation with the SHPO and ACHP would be required.

### 8.3.1.2 State LORS

CEQA requires a review to determine if a project will have a significant effect on archaeological sites or a property of historic or cultural significance to a community or ethnic group eligible for inclusion in the California Register of Historical Resources (CRHR) (*CEQA Guidelines*).

Other state-level requirements for cultural resources management appear in the California Public Resources Code Chapter 1.7, Section 5097.5 (Archaeological, Paleontological, and Historical Sites), and Chapter 1.75, beginning at Section 5097.9 (Native American Historical, Cultural, and Sacred Sites) for lands owned by the state or a state agency.

The disposition of Native American burials is governed by Section 7050.5 of the California Health and Safety Code and Sections 5097.94 and 5097.98 of the Public Resources Code, and falls within the jurisdiction of the Native American Heritage Commission (NAHC).

If human remains are discovered, the Sacramento County Coroner must be notified within 48 hours and there should be no further disturbance to the site where the remains were found. If the remains are determined by the coroner to be Native American, the Coroner is responsible for contacting the NAHC within 24 hours. The NAHC, pursuant to Section 5097.98 will immediately notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal (See Appendix 8.3A, Proposed Native American Burial Protection Plan for the CPP Construction Program).

### **8.3.1.3 Local LORS**

#### **8.3.1.3.1 Sacramento County**

The Sacramento County General Plan Conservation Element (December 15, 1993) declares its goal to promote the inventory, protection, and interpretation of the cultural heritage of Sacramento County, including historical and archaeological settings, sites, landings, features, artifacts, and/or areas of ethnic, historical, religious, or socio-economic importance. Section VI of the Conservation Element deals with Cultural Resources and describes policies and programs under six objectives:

1. Attention and care during project review and construction to ensure that cultural resource sites, either previously known or discovered on the project site, are properly protected with sensitivity to Native American values.

**Archaeologic Site Protection During Development.** The County's objective is: Attention and care during project review and construction to ensure that cultural resource sites, either previously known or discovered on the project site, are properly protected with sensitivity to cultural and ethnic values of all affected. It is addressed in the following policies:

**Policy CO-155**—Use the California Archaeological and the Sacramento History and Science Division to assist in determining need for survey.

**Policy CO-156**—Refer projects with identified archaeological and cultural resources to the Cultural Resources Committee to determine significance of resource and recommend appropriate means of protection and mitigation. The Committee shall coordinate with the Native American Heritage Commission in development recommendations.

**Policy CO-157**—Significant archaeologic, prehistoric, or historic sites shall be protected as open space for potential future excavation.

**Policy CO-158**—Native American burial sites encountered during preapproved survey or during construction shall, whenever possible, remain in situ. Excavation and reburial shall occur when in situ preservation is not possible or when the archaeologic significance of the site merits excavation and recording procedure. On-site reinterment shall have priority. The project developer shall provide the burden of proof that off-site reinterment is the only feasible alternative. Reinterment shall be the responsibility of local tribal representatives.

**Policy CO-159**—The cost of all excavation conducted prior to completion of the project shall be the responsibility of the project developer.

**Policy CO-160**—Monitor projects during construction to ensure crews follow proper reporting, safeguards, and procedures.

**Policy CO-161**—Not used; next Policy is CO-162.

**Policy CO-162**—As a condition of approval for discretionary projects that are in areas of cultural resource sensitivity, the following procedure shall be included to cover the potential discovery of archaeological resource(s) during development or construction:

Should any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered during any development activities, work shall be suspended and the Sacramento County Department of Environmental Review and Assessment shall be immediately notified. At that time, the Department of Environmental Review and Assessment will coordinate any necessary investigation of the site with appropriate specialists, as needed. The project proponent shall be required to implement any mitigation deemed necessary for the protection of the cultural resources. In addition, pursuant to Section 5097.98 of the State Public Resources Code and Section 7050.5 of the State Health and Safety Code, in the event of the discovery of human remains, all work is to stop and the County Coroner shall be immediately notified. If the remains are determined to be Native American, guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.

**2. Structures with architectural or historical importance preserved to maintain exterior design elements.**

**Historic Structure Preservation.** The County's objective is: Structures such as buildings, bridges, or other permanent structures with architectural or historical importance preserved to maintain exterior design elements. It is addressed in the following policies:

**Policy CO-163**—Conduct surveys and designate structures with architectural or historic importance on community plan maps. Where appropriate, plans shall designate significant historical architectural districts.

**Policy CO-164**—Develop local architectural preservation standards drawing from state and federal guidelines.

**Policy CO-165**—Refer projects involving structures or within districts having historical or architectural importance to the Cultural Resources Committee to recommend appropriate means of protection and mitigation.

**Policy CO-166**—Development surrounding areas of historic significance shall have compatible design in order to protect and enhance the historic quality of the areas.

**3. Known archaeological and historic sites protected from vandalism, unauthorized excavation, or accidental destruction.**

**Destruction of Cultural Resource Sites.** The County's objective is: Protect any known cultural resources from vandalism, unauthorized excavation, or accidental destruction. It is addressed in the following policies:

**Policy CO-167**—Restrict the circulation of cultural resource locational information to prevent potential site vandalism. This information is exempt from the "Freedom of Information Act."

**Policy CO-168**—Cooperate with other agencies to enforce laws and aggressively prosecute illegal collection of artifacts.

**Policy CO-169**—Design and implement interpretive programs about known archaeological or historical sites on public lands or in public facilities. Interpretation near or upon known sites should be undertaken only when adequate security is available to protect the site and its resources.

**4. Comprehensive knowledge of archaeologic and historic site locations.**

**Cultural Resource Surveys.** The County's objective is: Comprehensive knowledge of archaeologic and historic site locations. No specific policies are provided.

**5. Properly stored and classified artifacts for ongoing study.**

**Artifact Study and Storage.** The County's objective is: Properly stored and classified artifacts for ongoing study. No specific policies are provided.

**6. Public awareness and appreciation of both visible and intangible historic and cultural resources.**

**Public Awareness of Cultural Resources.** The County's objective is: Increase public education, awareness, and appreciation of both visible and intangible cultural resources. It is addressed in the following policies:

**Policy CO-170**—Provide historic and cultural interpretive displays, trails, programs, living history presentations, and public access to the preserved artifacts recovered from excavations.

**Policy CO-171**—Interpretive elements involving Native American cultural resources shall be located at village sites (provided any unexcavated resources are properly protected) representative of different physical environments found in the County.

The Sacramento County General Plan Public Facilities Element (August 12, 1998) declares its general energy facility policy object is to minimize the health, safety, aesthetic, cultural, and biological impacts of energy facilities in Sacramento County.

**Policy PF-7.1**—Locate and design production and distribution facilities so as to minimize visual intrusion problems in urban areas and areas of scenic and/or cultural value, including recreation and historic areas, scenic highways, landscape corridors, state or federal designated wild and scenic rivers, visually prominent locations such as ridges, designated scenic corridors and open viewsheds, and Native American sacred sites.

**Policy PF-7.3**—Minimize the potential adverse impacts of energy production and distribution facilities to environmentally sensitive areas by, when possible, avoiding siting in wetlands, permanent marshes, riparian habitat, vernal pools, oak woodlands, and historic and/or archaeological sites and/or districts.

With respect to cogeneration projects, the County states that “cogeneration land use issues are typically minor in most urban locations; however, displacements caused by cogeneration projects may significantly impact existing biological and cultural resources in rural areas.” With respect to electric transmission and subtransmission delivery systems, the County declared the following policy:

**Policy PF-8.9**—Locate and design new transmission towers in urban areas in a manner that minimizes visual and environmental impacts, including impacts to historic buildings and viewsheds.

With regard to electric transmission facility siting and design, the County declared its objective to plan and design transmission facilities to minimize visual impacts, preserve existing land uses, and avoid biological and cultural resources using the following policies:

**Policy PF-9.5**—Transmission lines should avoid to the greatest extent possible, cultural resources and biological resources such as wetlands, permanent marshes, riparian habitats, vernal pools, and oak woodlands.

**Policy PF-9.3**—Transmission lines should avoid paralleling recreation areas, historic areas, rural scenic highways, landscaped corridors, and designated federal or state wild and scenic river systems.

The County also states its policy objective (PF-118) to encourage siting gas mains near existing corridors to minimize disturbance to biological and cultural resources, and exposure to human populations. The County also recommends amending its Zoning Code Section 301-12 (Mitigation Measures for Transmission Facilities) to read as follows:

Overhead electrical transmission lines of 100,000 volts or greater capacity shall be installed in a manner so as to minimize adverse health, safety, biological, archaeological, visual, and aesthetic impacts. When possible, SMUD shall relocate and combine existing overhead transmission poles and lines with new installation.

The County also recommends amending the Zoning Code to be consistent with California Government Code Section 53091 with respect to the County’s regulatory authority (i.e., use permit is not required) for power plants, cogeneration facilities, and solar electric facilities, including mitigation measures for minimizing adverse health, safety, biological, historical, and archaeological impacts.

### **8.3.2 Affected Environment**

As described by Hart, Jenks, and Dore (2001) in their cultural resources inventory of 220 acres at the Rancho Seco Plant, California’s Central Valley was inhabited as early as 12,000 years ago; prehistorically and historically, the Miwok Indians occupied the CPP area hunting big and small game and gathering important vegetal resources like acorns.

Beginning in the late 1700s, the Indian population located in the Sacramento Valley came into contact with an entirely foreign (European) culture. Traditional life-ways were not drastically altered until the mid-1800s as Spanish colonization, Mexican land grants, and finally the American takeover and settlement pushed Indians into the rugged California interior. The California Gold Rush of 1849 and the influx of Euro-Americans into formerly remote regions of California was the final cultural blow for many California Indians, including the Miwok bands located in the CPP vicinity. Both mining and agriculture/ranching activities later dominated the project vicinity.

### 8.3.2.1 Natural Environment

CPP is located within the Central Valley of California – a huge basin characterized by broad alluvial plains dominated by annual grasslands and fresh emergent wetland habitats. The Central Valley is an elongated trough about 400 miles long and 50 miles wide, which between the Mesozoic and Cenozoic eras was a shallow marine embayment containing numerous lakes. The upper levels of the valley floor are composed of alluvium and flood materials. The topography of the project, like much of the valley, is flat with elevations ranging between 10 feet above mean sea level (asl) in the west and 150 feet asl in the east. Hydrological features within the CPP area include Laguna Creek, the Cosumnes River, Badger Creek, and Willow Creek.

The environmental setting has been largely altered by human modification over the past 150 years. The introduction of non-native grasses, slough channelization, creation of elaborate levee systems to control the Sacramento River, and agricultural activities have all changed the pre-1850 environment. Prior to the development of valley agriculture, marshy wetlands surrounding sluggish waterways supported marshy or aquatic communities of tule (*Scirpus* sp.), cottonwood (*Populus fremontii*), sycamore (*Platanus racemosa*), and willow (*Salix* sp.) (Wallace, 1978a). Oak groves occurred along some waterways and likely included interior live oaks (*Quercus wislizeni*) and valley oaks (*Q. lobata*); thus, providing a portion of the vegetal food sources used by prehistoric populations. In the Cosumnes River Preserve, habitat and vegetation similar to that which was once present in the pre-1850 environment can still be found.

Euro-American settlement has probably altered the variety of nondomesticated animal species found in the project area. Larger mammals such as black bear (*Ursus americanus*), black-tailed deer (*Odocoileus hemionus*), mule deer (*O. Heminous hemionus*), and mountain lion (*Felix concolor*) are now limited to the surrounding foothills and mountain ranges. Tule elk (*Cervus elaphus nannoides*) and pronghorn (*Antilocapra americana*), once common throughout the valley, now exist in limited locations around the state (Jameson and Peeters, 1988).

The marshy wetlands once common in the area provided a rich habitat for migratory waterfowl such as the mallard duck (*Anas platyrhynchos*), northern pintail (*A. acuta*), and green-winged teal (*A. crecca*) currently found in the valley. Other birds include the northern flicker woodpecker (*Colaptes auratus*), great blue heron (*Ardea herodias*), red-tailed hawk (*Buteo jamaicensis*), belted kingfisher (*Ceryle alcyon*), and red-winged blackbird (*Agelaius phoeniceus*). The Cosumnes and Sacramento rivers once supported anadromous and freshwater fish including salmon (*Oncorhynchus* sp.), golden trout (*Salmo aguabonita*), river lamprey eel (*Lampetra ayresi*), and white sturgeon (*Acipenser transmontanus*).

In areas of historic homesteads, non-native trees are common such as English and black walnut, pecan, acacia, fruit trees, eucalyptus, and shrubs and flowers such as roses, wisteria, lilac, and azalea. Homesteads now present a sharp contrast to the modern intensive agricultural use that has created dramatic changes in the regional vegetation. Where native oaks and grasslands were once common, now lands are dedicated to row crops, grain fields, and pasture (Maniery, Baker and Maniery, 1994).

### 8.3.2.2 Prehistoric Background

The CPP project area is situated in an area of moderate to high archaeological sensitivity. As described by Hart, Jenks, and Dore (2001), only a few archaeological sites have been found in the Sacramento Valley that date prior to 5,000 years ago (even though the project area and the greater Sacramento Valley have been occupied for about 12,000 years). Much of the evidence for human occupation is probably buried beneath alluvial sediments that accumulated quickly during the later Holocene epoch. Moratto (1984) estimated that as much as 10 meters of sediment accumulated along the lower stretch of the Sacramento Drainage over the past 5,000 to 6,000 years.

Three general patterns of prehistoric Indian resource exploitation have been identified for the time period 2500 B.C. to A.D. 1500 (Moratto, 1984). The earliest is the Windmill Pattern that lasted from about 2,500 B.C. to 1,000 B.C., during which time it is thought that there was a mixed economy of both game procurements as well as the exploitation of wild plant foods. The archaeological record contains numerous projectile points with a wide variety of faunal remains. The Windmill toolkit contains fishing hooks and spears, and the remains of sturgeon, salmon, and other fish are found in middens dating to this period (Moratto, 1984). Windmill Pattern settlement patterns reflect seasonal adaptation; habitation sites in the valley were occupied during the winter with populations moving into the foothills during the summer (Moratto, 1984).

Over a 1,000 year period from about 1500 B.C. to 500 B.C., the Windmill Pattern began to shift to a more specialized type of adaptive pattern called the Berkeley Pattern. A decrease in the number of manos and metates and an increase in mortars and pestles indicates a shift in resource use to greater reliance upon acorns – mortars and pestles were used to break the tough outside shell of acorns and grind the nut while manos and metates were used mainly for grinding grains from different grasses. Berkeley Pattern sites located near water are found to have large shellmounds indicating intensive use of marine and estuarine resources. Hunting was still an important activity in the Berkeley Pattern (Fredrickson, 1973).

After about 500 A.D., the Berkeley Pattern shifts to the Augustine Pattern with changes in subsistence and land use patterns beginning to reflect the use pattern known from historic period Native American groups in the area. This pattern demonstrates a shift to more elaborate ceremonial and social organization and the development of social stratification. Exchange networks were developed and more intensive emphasis was placed on acorn use. Other elements of the material culture include flanged tubular smoking pipes, clam shell disk beads, small projectile point types known as Gunther Barbed (associated with bow-and-arrow use), harpoons, and elaborate baked clay figurines and pottery vessels known as Consumnes Brownware. Other traits include introduction of pre-interment burning of offerings in a grave pit during the mortuary ritual, increased village sedentism, population

growth, and an incipient monetary economy in which beads were used as a medium of exchange (Moratto, 1984).

The broad adaptive patterns described above (Windmiller, Berkeley, and Augustine) are recognized here as being an important interpretive framework for understanding local prehistory. Also important are several taxonomic schemes that have been used over the past few decades to explain culture change through time – as seen in the archaeological record of Central California.

A three-part cultural chronological sequence, the Central California Taxonomic System (CCTS) was developed by archaeologists to explain local and regional cultural change in prehistoric central California from about 4,500 years ago European contact times (Lillard, Heizer, and Fenenga, 1939; Beardsley, 1948, 1954). In 1969, several researchers who met at UC Davis worked out several substantive taxonomic problems that had developed with the CCTS. Table 8.3-2 summarizes David Fredrickson's (1994) cultural periods model and provides CCTS classification nomenclature (such as "Early Horizon," etc). Another scheme proposed by Chartkoff and Chartkoff (1984), shown in Table 8.3-3, is also used.

**TABLE 8.3-2**  
Hypothesized Characteristics of Cultural Periods in California

1800 A.D. Upper Emergent Period Phase 2, Late Horizon	Clam disk bead money economy appears. More and more goods moving farther and farther. Growth of local specializations relative to production and exchange. Interpenetration of south and central exchange systems.
1500 A.D. Lower Emergent Period Phase 1, Late Horizon	Bow and arrow introduced, replace atlatl and dart; south coast maritime adaptation flowers. Territorial boundaries well established. Evidence of distinctions in social status linked to wealth increasingly common. Regularized exchanges between groups continue with more material put into the network of exchanges.
1000 A.D. Upper Archaic Period Middle Horizon Intermediate Cultures	Growth of sociopolitical complexity; development of status distinctions based on wealth. Shell beads gain importance, possibly indicators of both exchange and status. Emergence of group-oriented religious organizations; possible origins of Kuku religious system at end of period. Greater complexity of exchange systems; evidence of regular, sustained exchanges between groups; territorial boundaries not firmly established.
500 B.C. Middle Archaic Period Middle Horizon Intermediate Cultures	Climate more benign during this interval. Mortars and pestles and inferred acorn economy introduced. Hunting important. Diversification of economy; sedentism begins to develop, accompanied by population growth and expansion. Technological and environmental factors provide dominant themes. Changes in exchange or in social relations appear to have little impact.
3000 B.C. Lower Archaic Period Early Horizon Early San Francisco Bay Early Milling Stone Cultures	Ancient lakes dry up as a result of climatic changes; milling stones found in abundance; plant food emphasis, little hunting. Most artifacts manufactured of local materials; exchange similar to previous period. Little emphasis on wealth. Social unit remains the extended family.
6000 B.C. Upper Paleo-Indian Period San Dieguito Western Clovis 8000 B.C.	First demonstrated entry and spread of humans into California; lakeside sites with a probable but not clearly demonstrated hunting emphasis. No evidence for a developed milling technology, although cultures with such technology may exist in state at this time depth. Exchange probably ad hoc on one-to-one basis. Social unit (the extended family) not heavily dependent on exchange; resources acquired by changing habitat.

**TABLE 8.3-3**  
**Chartkoff and Chartkoff (1984) Model of Cultural Periods in California**

11,500-9,000 B.C. Pre-Archaic Period	Pre-Archaic populations were small and their subsistence included big game hunting of now extinct mammoth and mastodon. Research indicates that the Pre-Archaic economies were based on a wide-ranging hunting and gathering strategy, dependent to a large extent on local lake-marsh or lacustrine habitats.
9,000-4,000 B.C. Early to Middle Archaic Period	During the Early and Middle Archaic periods, prehistoric cultures began putting less emphasis on large-game hunting. Subsistence economies probably diversified somewhat, and Archaic era people started using such ecological zones as the coast littoral more intensively than before. Advances in technology (milling stones) indicate that new food processing methods became important, enabling more efficient use of certain plant foods, including grains and plants with hard seeds.
4,000-2,000 B.C. Late Archaic Period	An important technological advance was the discovery of a tannin-removal process for the abundant and nutritious acorns. Prehistoric trade networks developed and diversified, bringing raw materials and finished goods from one region to another. Resource exploitation, as during the Early and Middle Archaic, was generally seasonal. Bands moved between established locations within a clearly defined/defended territory, scheduling resource harvests according to their availability. Clustering of food resources along the shores of large lakes or the banks of major fish-producing rivers allowed for larger seasonal population aggregates. Dispersed resources, such as large and small game, during the winter prompted small family groups to disperse across the landscape for more efficient food harvesting. The spear thrower (atlatl) may have been introduced or increased in importance, accounting for a change in projectile point styles from the Western Stemmed to the Pinto and Humboldt series. Seed grinding increased in importance.
2,000 B.C.-A.D. 500 Early and Middle Pacific Periods	The Pacific Period is marked by the advent of acorn meal as the most important staple food. Increasing population densities made it desirable and necessary for Indian populations to produce more food from available land and to seek more dependable food supplies. The increasing use of seed grinding and acorn leaching allowed for the exploitation of more dependable food resources; increased use of previously neglected ecological zones (the middle and high Sierran elevations) may also have been part of this trend.
A.D. 500-1400 Late Pacific Period	Around A.D. 500 – 600, a cultural watershed was triggered by the introduction of the bow and arrow, which replaced the spear thrower and dart as the hunting tool/weapon of choice. The most useful time markers for this period tend to be small projectile points/arrow tips. Another trend is the marked shift from portable manos/metates to bedrock mortars/pestles (Moratto, 1984). Moratto, et al. (1978) demonstrated that this was a time of cultural stress, during which trading activity abated, warfare was common, and populations shifted away from the Sierra Nevada foothills to higher mountain elevations. They explain these changes in terms of rapid climatic fluctuations, including a drier climate and a corresponding shift of vegetation zones.
A.D. 1400-1789 Final Pacific Period	Populations became increasingly sedentary and depended more on staple foods, even as the diversity of foods exploited increased. Permanent settlements with high populations were more common. Every available ecological niche was exploited, at least on a seasonal basis. Other trends included the resurgence of long-distance trade networks and the development of more complex social and political systems.

Moratto (1984) suggested the Early Horizon dated to circa 4,500 to 3,500/3,000 years ago with the Middle Horizon dating to circa 3,500 to 1,500 years ago and the Late Horizon dating to circa 1,500 to 250 years ago. The Early Horizon is the most poorly known of the periods with relatively few sites known or investigated. Early Horizon traits include hunting, fishing, use of milling stones to process plant foods, use of a throwing board and spear ("atlatl"), relative absence of culturally affected soils (midden) at occupation sites, and elaborate burials with numerous grave offerings.

Middle Horizon sites are more common and usually have deep stratified deposits that contain large quantities of ash, charcoal, fire-altered rocks, and fish, bird and mammal bones. Significant numbers of mortars and pestles signal a shift to plant foods from reliance on hunted animal foods. Middle Horizon peoples generally buried their dead in a fetal position and only small numbers of graves contain artifacts (and these are most often utilitarian). Increased violence is suggested by the number of burials with projectile points embedded in the bones or with other marks of violence.

The Late Horizon emerged from the Middle Horizon with continued use of many early traits and the introduction of several new traits. Late Horizon sites are the most common and are noted for their greasy soils (midden) mixed with bone and fire-altered rocks. The use of the bow-and-arrow, fetal-position burials, deliberately damaged ("killed") grave offerings, and occasional cremation of the dead are the best known traits of this horizon. Acorn and seed gathering dominated the subsistence pattern with short and long-distance trade carried out to secure various raw materials. Compared to earlier peoples, Late Horizon groups were short in stature with finer bone structure, evidence perhaps of the replacement of original Hokan speaking settlers by Penutian speaking groups by circa 1,500 years ago.

### 8.3.2.3 Ethnographic Background

The CPP area is located in an area historically occupied by the Eastern Miwok (see Figure 8.3-1), of which there once existed seven language divisions. Each division belonged to the Miwokan subfamily of the Utian family, Penutian stock (Shiple, 1978). Each of the primary Miwok divisions included various dialects. Eastern Miwok included five separate groups: the Bay, Plains, Northern Sierra, Central Sierra, and Southern Sierra. The Bay division ranged over the area around Walnut Creek and the Sacramento-San Joaquin Delta while the Plains division occupied the lower Mokelumne and Cosumnes rivers and the Sacramento River from Rio Vista to Freeport. The CPP area falls within the Plains Miwok subdivision (Hart, Jenks, and Dore, 2001).

Few Plains Miwok were alive when ethnographers began working with Native Americans in the early 1900s; as a result, the most comprehensive study of the Miwok was compiled using Spanish mission records, diaries, and journals (Bennyhoff, 1977). The Plains Miwok relied on the rich resources of the Delta and surrounding areas for food and material needs. Tules provided material for woven matting and for house and canoe construction and clothing; tule roots were pounded and used for food. Pronghorn antelope, elk, deer, and other large game were sought in the tule marshes of the Delta (Kroeber, 1925). It was the acorn, however, that provided the main dietary staple for the Miwok. Acorns were stored in granary bins and were complemented by the abundant waterfowl, fish, shellfish, and large

game that lived in or visited the Cosumnes River region (Bennyhoff, 1977; Levy, 1978). Hart, Jenks, and Dore (2001) describe the Miwok as seasonally mobile hunter-gatherers with semi-permanent villages; acorns were the main food staple but other foods included buckeye, seeds, bulbs, pine nuts, deer, elk, rabbits, squirrels, fowl, salmon and other fish, bear, and insects.

Exotic items such as obsidian, steatite, and shell were obtained in trade from coastal groups to the south and west and from mountain tribes (Levy, 1978). The Delta islands were also used regularly for hunting and fishing base camps. Social structure centered around the tribelet with small satellite villages radiating from a main tribelet center (Kroeber, 1925). The Plains Miwok placed their permanent settlements on high ridges or knolls near watercourses or on the sandy islands in the Delta.

Native life ways changed after 1790 with increased Spanish incursions into the Sacramento Valley as soldiers searched for potential mission neophytes. The main river groups of the region were forced into the Spanish mission system between 1806 and 1814; natives not removed to the missions succumbed to introduced diseases that spread through the Delta between the late 1700s and circa 1835 (Cook, 1955; Levy, 1978). By the time ethnographers began gathering data in the early 1900s, there were only a few survivors of the Plains Miwok (Levy, 1978; Merriam, 1907, 1955). Today, Native Americans related to Miwok ancestry are living in Ione, Galt, Stockton, near Wilton, and Sacramento. These groups and individuals are interested in preserving and protecting vestiges of their past (Maniery, Baker and Maniery, 1994).

### **8.3.2.4 Historical Background**

Recorded history in Central California can be divided into the Spanish Period (1769-1821), the Mexican Period (1821-1848), and the American Period (1848-present).

#### **8.3.2.4.1 Spanish Period**

The first recorded penetration of the CPP area was accomplished in 1772 by Pedro Fages whose written record describes the Valley as "a labyrinth of lakes and tulares in the middle of a great plain" (Wedel, 1941). In 1776, Spanish Army Colonel Juan Bautista De Anza, accompanied by Spanish settlers, soldiers, and Franciscan Fray Pedro Font left Monterey bound for northern California with orders to locate sites for a presidio and mission. Anza traveled through the Bay Area, finally stopping in the Carquinez Strait region.

The next most important penetration of Euro-Americans were Spanish explorers led by Lieutenant Gabriel Moraga in 1808. Moraga was to locate suitable locations for missions and to capture runaway Mission Indians. He followed waterways inland and his caravan crossed the Mokelumne, Cosumnes, and American Rivers in early October 1808 and explored up the Feather River. The first river-based expedition took place in 1811 when Spanish explorers briefly surveyed the San Joaquin and Sacramento Rivers (Grunsky, 1989).

In 1817, a more substantial exploration occurred when Luis Arguello (later a Mexican governor of California, but then the Spanish commander of the San Francisco Presidio) traveled up the Sacramento River and continued onto the Feather River. This was the last Spanish expedition into the Alta California interior before the 1822 Mexican revolution against the Spanish crown. The interior of the Sacramento Valley, located away from the

easily defended and more accessible chain of coastal missions and pueblos, was left largely untouched by the Spanish and "Californios" (Hoover, et al., 1990).

#### **8.3.2.4.2 Mexican Period**

The Mexican revolt of 1822 resulted in independence as well as possession of both Baja and Alta California. Mexico abandoned colonization through presidio, pueblo, and mission building and instead began an era of extensive land grants to Mexican citizens who lived in California (the "Californios"). The Mexican emphasis on inland grants was designed to build a population base away from the settled coast in hopes of staving off foreign intrusion (Hart, Jenks, and Dore, 2001). Part of CPP passes through part of one such large land grant - Sanjon de los Moquelumnes (see below).

Beginning in 1826, Jedediah S. Smith, an American "mountain man" began a period of exploration of the western Sierra Nevada and foothill valleys based on a search for valuable furs and pelts. In 1827, Smith spent months trapping in and around the Sacramento Valley, camping near Wilton and the Rosemont section of modern-day Sacramento, and traveling along the nearby Cosumnes and American Rivers.

In late 1832 to early 1833, disease ("fever and ague" or "remittent fever") struck among the Indian inhabitants of the Sacramento Valley (probably cholera or typhus). A second epidemic struck in 1837, further reducing the Sacramento Valley indigenous population. These significant losses severely impacted California Indians' ability to cope with, and even resist, the tens of thousands of miners, entrepreneurs, and settlers drawn to the Sacramento Valley by the discovery of gold in 1849. Despite this dramatic loss of human life, traditional inhabitants are still represented near the Rancho Seco Plant project area by the Wilton Rancheria - a Miwok reservation established by the U.S. government in 1916. Since the 1960s, this Miwok band has owned the land set in the heart of their traditional territory (Elk Grove History Club, 1975).

Mexican Governor Jose Figueroa issued the first land grant in the Sacramento area in 1833 to John Rogers Cooper (an English-born sea captain married into a prominent Californio family). The two largest land grants in the Sacramento Valley belonged to John Sutter who founded New Helvetia - a trading and part-time military post (in 1839) (Jones and Stokes, 1997). New Helvetia was the only settlement in this part of California and became the area's social, commercial, and political center. Three smaller Mexican-era land grants were located closer to the CPP area. Rancho Omochumnes was granted to William Sheldon and William Daylor in 1844 and encompassed 18,662 acres. The area around Sloughhouse and the Cosumnes River includes some of the oldest Anglo American settlements in the Central Valley. As early as 1848, modern-day Jackson Road was established as the main route to and from Sacramento and the Cosumnes River area.

In the mid-1840s, Rancho Zanjon (Sanjon) de los Moquelumnes was created around modern-day Elk Grove and was owned by the Anastacio Chabolla family. Nearby Rancho Cosumnes was centered around Wilton and along the Cosumnes River to the north (and was owned by the Heleno family); and the existing Rancho Seco Plant is located on the far-eastern edge of the Rancho Arroyo Seco land grant (owned by Teodosio Yorva) (Hart, Jenks, and Dore, 2001). Increasingly bad relations between the United States and Mexico led to the Mexican-American War of 1847, which resulted in Mexico releasing California to the United States under the Treaty of Guadalupe Hidalgo in 1848. Under the Treaty, "... all

grants of land made by the Mexican government . . . shall be respected as valid." However, one of the first acts of Congress after California statehood in 1850 was to pass the California Land Act by which each Spanish and Mexican land grant had to be reviewed by a land court and the U.S. Attorney General for legal title.

#### 8.3.2.4.3 American Period

In the early 1850s, most of Sacramento County's population was concentrated either in the growing city of Sacramento or in the numerous gold camps that dotted the foothills. The CPP site was located within the Alabama Township, established in 1856 (with an estimated population of 250, which probably did not include Chinese, African-Americans, or Indians).

Gold mining occurred at Dry Creek, Deer Creek, and the Cosumnes River. Mining included placer mining and hydraulic mining. Large-scale hydraulic mining was generally confined to areas along the Cosumnes River until it was outlawed in the 1880s because of the environmentally destructive nature of this mining method (Marvin and Fryman, 1994). Mining near the project area continued until the 1950s, but was greatly reduced in scale. Chinese miners often worked abandoned diggings around the project area until the early 20th century, and gold dredging activities were conducted on the American and Cosumnes rivers. A small dredging site may have been located north of Clay Creek during the 1930s and 1940s (Marvin and Fryman, 1994).

During the 1860s and 1870s the rural project area mostly lacked improved transportation systems that were becoming more common in urbanized areas like Sacramento. During the 1860s, the area's single stage line followed Laguna Creek to the Stockton road (about 7 miles west of Rancho Seco). An east-west road connected the stage line and Camino del Sacramento (Marvin and Fryman, 1994). In 1877, the Central Pacific Railroad completed construction of the Amador Branch Railroad that connected the small communities of Galt and Ione. The Central Pacific controlled the huge Arroyo Seco land grant since 1863, but then purchased the tract from California owner Teodosio Yorva after Yorva's grant was confirmed by the U. S. Land Commission. The Central Pacific immediately evicted the small farmers who had squatted the land grant since statehood. The Central Pacific used Arroyo Seco lands for stock grazing while the Amador line was used to move coal mined in adjacent Amador county. The Southern Pacific Railroad took over the Central Pacific holdings in the 1890s (Marvin and Fryman, 1994).

The Central Pacific permitted access to markets that were formerly unreachable by local residents, and towns such as Galt grew along the rail line. While stock raising continued to dominate local farming practices, hay and barley for stock feed were also cultivated. During the early 20th century, the agricultural industries in the project area grew to include fruit orchards, hops production, and vineyards (Costello, 1993). Poultry farms were also common and one dairy farm – the Scully Dairy – operated in the project area (Marvin and Fryman, 1994).

Agriculture dominated the project area for most of the 20<sup>th</sup> century and continues to do so now. In 1966, SMUD acquired 2,480 acres to begin construction of the proposed Rancho Seco Plant; operations began in 1971. The power plant has had a controversial history including numerous "shut downs," explosions, and fires. On June 6, 1989, Sacramento County voters agreed to permanently close Rancho Seco (Hart, Jenks, and Dore, 2001).

### 8.3.2.5 Resources Inventory

The CPP site was subject to cultural resources inventory by Garcia and Associates (Hart, Jenks, and Dore, 2001) while the linear facilities were subject to cultural resources inventory by both Garcia and Associates and CH2M HILL. This resources inventory is based on both archive/ background research and surface pedestrian reconnaissance survey. A detailed discussion of the results of the resource inventory is presented in the subsections below. Contacts with the NAHC did not result in the identification of traditional cultural properties in the project area (see Appendix 8.3B).

#### 8.3.2.5.1 Archival Research

Previous cultural resource studies conducted by Garcia and Associates (GANDA), which included the project areas plus a 0.5 mile radius were reviewed (Hart, Jenks, and Dore, 2001) (see Confidential Appendix 8.3C). A discussion of the cultural resources sites in conflict with, or in potential conflict with, project elements (plant site, natural gas supply lines, etc.) are addressed in Section 8.3.3. The following elements are included in CPP and its area of potential effect:

- CPP generation plant site
- Natural gas supply line

As explained by GANDA in its management summary (Hart, Jenks, and Dore, 2001):

Garcia and Associates conducted a cultural resources inventory of 220 acres at the Rancho Seco nuclear facility for the Sacramento Municipal Utilities District (SMUD) to assist the California Energy Commission in their compliance with the California Environmental Quality Act. As a result of the inventory, two historic period archaeological sites, CA-SAC-500H and CA-SAC-504H, and one prehistoric period archaeological resource, ARS 85-15-1, were identified. The status of the historic period archaeological resources as significant historical resources to be considered under CEQA is currently unknown. Further studies to determine if these resources meet the significance criteria are recommended. The prehistoric archaeological resource, ARS 85-15-1, while it has not had its significance formally evaluated, was determined not to be a significant resource by SMUD in 1985. A paleontological study of the project area undertaken by LaRamie Soils Service did not find any significant vertebrate fossil localities.

GANDA, in addition to its inventory of the proposed CPP site, also conducted an alternatives screening analysis for their direct client, Davis Environmental Consulting of Davis, California (Dore, 2001):

Garcia and Associates conducted a cultural resources record search at the California Historical Resources Information System (CHRIS) for two main gas line alternatives (Northeast and Southwest) and a number of sub-alternatives. The alternatives run between the Carson Ice-Gen facility and the Rancho Seco Plant in southern Sacramento County.

The record search was conducted between March 27, and April 10, 2001. CHRIS was asked to check all available records for the alignments and a one-quarter-mile radius. These records include the National Register of Historic Places, the

California Register of Historical Resources, California Historical Landmarks, and California Historical Points-of-Interest. The search also included additional sources for portions of the project area when these sources were available. The record search included the identification of areas previously surveyed for cultural resources as part of other research and compliance investigations.

Work by paleontologist Dr. Michael Cassiliano, that included background research and field inspection, has determined that all pipeline corridors and alternatives have equal and low probability for paleontological resources.

Garcia and Associates' were not commissioned to conduct any field reconnaissance surveys of the various gas line alternatives and sub-alternatives.

CH2M HILL was commissioned by SMUD in July 2001 to conduct a cultural resources field reconnaissance of the selected gas line route (see Figures 8.3-2a – 8.3-2e), which is substantially the Southwest alternative subject to GANDA's literature search conducted earlier in 2001 (see above). CH2M HILL has not been authorized to conduct any further investigations or evaluations of the 220-acre CPP site investigated earlier in 2001 by GANDA (Hart, Jenks, and Dore, 2001).

CH2M HILL's examination of the results of GANDA's archive and literature search for the Southwest alternative resulted in the determination that some known/recorded cultural resources might be affected by construction of the gas line route. These are described below.

#### ***Elliot Ranch***

As illustrated in Confidential Appendix 8.3D, on Map 1 of 6, the gas line passes within 400 to 500 feet of the location of Elliot Ranch Isolated Find No. 1 and within 1,400 feet of Elliot Ranch No. 2. Neither of these resources will be affected by the project and they lie well away from the construction zone.

Elliot Ranch Isolate Find No. 1 (CHRIS has not issued a "trinomial" for this isolated find) is an isolated windmill foundation with no associated artifacts that is located near the Elliot Ranch Complex. The foundation is of concrete and has a probable 1927 date inscribed into the cement (Maniery, 1985). Elliot Ranch No. 2 (CHRIS has not issued a "trinomial" or Primary Record number for this resource) is the actual Elliot Ranch Complex. The original house and barracks were constructed in 1925 and the existing two houses, barracks, barns, outbuildings, corral, and sheds are serving as the headquarters for the Elliot Cattle Ranch. Archaeologically, the site has been impacted by ongoing use for decades and does not meet CEQA guidelines (Maniery, 1985). However, the historic architectural value of the buildings was not evaluated at this time (1985) and may meet CEQA criteria for historic resources (Maniery, 1985).

#### ***Knopfel Dairy***

As illustrated in Confidential Appendix 8.3D, on Map 2 of 6, the gas line passes within about 800 feet of the Knopfel Dairy. The Knopfel Dairy, which is ineligible for listing in the National Register of Historic Places (National Register Status 6Z2), will not be affected by the project and lies well away from the construction zone. The Knopfel Dairy Complex is located at 4831 Bilby Road; the following description is provided by Peak and Associates (1999):

The building record for this residence indicates a date of construction of 1920, which is consistent with the style of still another Craftsman bungalow. The side gabled roof is extended, without a change in pitch, to cover a full width entry porch on the front (south) elevation, but there is also a cross gable to further emphasize the entry. Four plain, square wooden pillars support the porch roof and a plain wooden balustrade runs between pillars and from corner pillars to wall. The front windows, which appear original, are fixed and consist of a large main pane and transom. Other windows have been replaced with aluminum framed versions. Roofing is composite shingles. Typical Craftsman elements include the exposed rafter ends and the narrow lapped siding. There are corner brackets of sorts on the gable ends, consisting of a single piece of lumber extending at a sharp angle from the wall just below the roof line to the roof edge and slightly beyond. East of the houses are the utility buildings of the Knopf Dairy. These consist of a frame barn, metal sides and roofed shed and a cinder block shed. The first two were probably built in about the same era as the residence. The cinder block structure is obviously much newer, as is the mobile home that sits behind and to the east of the residence. There does not appear to be anything unusual in the architecture of this house. If the 1920 date is correct, then it was built rather late in the period of greatest popularity for this style. It does not appear to be architecturally significant. The associated barn and shed are also entirely standard structures and in poor repair as well. Interestingly, this structure appears on the 1968 Florin USGS map but disappears on the photorevised version of 1980, although the barn and outbuildings appear on the later. There does not appear to be a reason for this.

#### **CA-SAC-68**

As illustrated in Confidential Appendix 8.3D, on Map 4 of 6, the gas line passes within 100 to 200 feet of the mapped location of prehistoric archaeological site CA-SAC-68. As described on the Archaeological Site Survey Record (JM/MB 1949), CA-SAC-68 is a "mound in old waterway of Cosumnes River, flood waters have probably destroyed most of site." No other information is available. This prehistoric archaeological site, if still extant, might be affected by project construction. Mitigation measures recommended for CA-SAC-68 are described later.

#### **CA-SAC-93**

As illustrated in Confidential Appendix 8.3D, on Map 4 of 6, the gas line may affect prehistoric archaeological site CA-SAC-93, whose actual location is not well understood. As illustrated in Confidential Figure 8.3-3, the site is mapped as being located some 1,000 feet south of the proposed gas line. Its "alternative" locations are either on top of the proposed gas line or about 100 to 200 feet north of the proposed gas line. The only information provided on the Archaeological Site Survey Record (prepared by Robert F. Heizer and R. Massey in 1937) is that it is a "village site on [a] mound in [the] middle of [a] cultivated field, north of Allyn-Valensin line fence" and "surface indications [exist] of artifacts [and] burials." This prehistoric archaeological site, if still extant, might be affected by project construction. Mitigation measures recommended for CA-SAC-93 are described later.

**Arno Townsite (ca. 1910)**

As illustrated in Confidential Appendix 8.3D, on Map 4 of 6, the gas line passes with 200 to 300 feet of the Arno Townsite (ca. 1910). As described by Nelson (2000), the ca. 1910 Government Land Office (GLO) maps place the location of the historic town of Arno just south of Badger Creek, adjacent to the railroad tracks. Nelson's (2000) field survey located the town site on the edge of agricultural fields adjacent to the railroad and noted that the farmers appear to be avoiding impacts to the site. The site includes old non-native trees and a complex of corrals. Some debris were noted on the ground; however, visibility was limited. According to Gudde (1969), a post office was established at Arno around 1890 and was named after the river in Italy. Julio Valensin, an Italian, and Alice McCauley, daughter of the owner of the land, were married in Florence, which is situated on the Arno River. This historic townsite and its associated archaeological remains (if present), might be affected by project construction. Mitigation measures recommended for Arno Townsite are described later.

**Hicksville (1910 map)**

As illustrated in Confidential Appendix 8.3D, on Map 4 of 6, the gas line passes within 200 to 300 feet of Hicksville (1910 map). No other information is available at CHRIS on this historic townsite. The Hicksville Cemetery is illustrated on the USGS map as located just north of Arno Road. This historic townsite, historic cemetery, and associated archaeological remains (if present), might be affected by project construction. Mitigation measures recommended for Hicksville and Hicksville Cemetery are described later.

**Arno School**

As illustrated in Confidential Appendix 8.3D, on Map 4 of 6, the gas line passes within 100 feet of the Arno School (1910). No other information is available at CHRIS on this building located just south of Arno Road. This historic schoolhouse and its associated archaeological remains (if present), might be affected by project construction. Mitigation measures recommended for the Arno School are described later.

**Hadselville Creek Bridge**

As illustrated in Confidential Appendix 8.3D, on Map 6 of 6, the gas line passes within 200 feet of the Hadselville Creek Bridge (24C0276). This bridge was constructed in 1960 and has been determined by Caltrans to be eligible for listing in the National Register of Historic Places (Caltrans 2000). This bridge would not be affected by project construction.

**Western Pacific Railroad**

As illustrated in Confidential Appendix 8.3D, on Maps 1, 2, and 3 of 6, the gas line would be constructed alongside the Western Pacific Railroad tracks. As noted by Maniery, Baker, and Maniery (1994), Joseph Sims, an early rancher, sold a right-of-way easement through his property to the Western Pacific Railroad sometime between 1904 and 1907 (Butler, 1923). CHRIS has no records on file indicating that the Western Pacific Railroad has ever been recorded (or evaluated) as a historic resource. As explained below in reference to the Southern Pacific Railroad, it is unlikely that the Western Pacific Railroad would be found eligible for listing in the National Register of Historic Places.

While it is possible that historic archaeological remains associated with railroad construction or operation might be discovered during construction adjacent to the railroad tracks, the gas line construction itself will not affect the tracks or railroad grade. Mitigation measures

recommended for construction adjacent to the Western Pacific Railroad tracks are described later.

### ***Southern Pacific Railroad***

As illustrated in Confidential Appendix 8.3D, on Map 4 of 6, the gas line would be constructed beneath the Southern Pacific Railroad tracks using directional boring techniques. CHRIS has no records on file indicating that the Southern Pacific Railroad has ever been recorded (or evaluated) as a historic resource. As explained by Nelson (2000), the railroad played an important role in the development of towns and agriculture in the Central Valley. Construction of the San Joaquin Valley branch of the Central Pacific Railroad (later Southern Pacific – and now Union Pacific) began in 1870. Nelson (2000) notes:

Placement of the railroad line was based on town promotion and town site acquisition by the railroad, in addition to engineering considerations such as bridging waterways. Many of the larger cities in the valley were laid out as isolated railroad towns in the 1870s and 1880s and shared a common plan of a central depot with the surrounding uniform plat. These railroad towns were laid out on a rectangular grid aligned with the tracks rather than with those established by traditional government survey. Due to the construction of the railroad, the population in the San Joaquin Valley grew by 45 percent between 1870 and 1880. By the 1880s, the railroad established 50 stations in six San Joaquin Valley counties. Town sites were built at 24 stations; of these, eight became major towns. Much of the railroad construction was built with Chinese labor; as a result, Chinatowns were established in several towns along the route, such as Hanford in Kings County.

Historic site CA-STA-350H is the Southern Pacific San Joaquin Valley Mainline was documented by Nelson (2000). Nelson's evaluation of the historic significance and National Register of Historic Places eligibility of the Southern Pacific Mainline is relevant to all the railroad tracks that will be crossed by CPP construction or where CPP construction will take place adjacent to railroad tracks:

The resources that would be significant and eligible for the National Register would be those that were related to the original construction of the Southern Pacific main line through the San Joaquin Valley during the period 1869-1876, or which exhibit important characteristics (construction techniques, engineering features, etc.) of that period. Like most heavily used main railroad routes, this line has aspects that are more similar to a machine than a structure. As with all pieces of heavy equipment, over time parts become worn out or break and are then replaced. The technology of railroad construction has also undergone significant evolution in the past 100 years with respect to rail manufacturing. The iron rails laid in the 1870s were far different from the modern rails rolling out of steel plants today. In the case of the 35 mainline sites (SPM-1 through SPM-35), the major resource related to the period of significance (1869-1876) is the ROW itself; all other resources – rails, tie plates, ties, ballasting, signals, warning arms, road crossings, etc. – have been replaced and exhibit either dates or characteristics that place their installation well after the period of significance.

While it is possible that historic archaeological remains associated with railroad construction or operation might be discovered during construction while boring beneath the Southern Pacific tracks, the gas line construction itself will not affect the tracks or railroad grade. Mitigation measures recommended for construction beneath the Southern Pacific Railroad tracks are described later.

#### ***Central California Traction Railroad***

As illustrated in Confidential Appendix 8.3D, on Map 5 of 6, the gas line would be constructed beneath the Central California Traction Railroad tracks using directional boring techniques. As described above for the Southern Pacific Railroad, only the ROW itself for the Central California Traction Railroad would be related to the period of significance of the Central California Traction Railroad (CHRIS has no records on file related to the inventory or evaluation of this railroad facility in the CPP area).

While it is possible that historic archaeological remains associated with railroad construction or operation might be discovered during construction beneath the railroad tracks, the gas line construction itself will not affect the tracks or railroad grade. Mitigation measures recommended for construction beneath the Central California Traction Railroad tracks are described later.

#### ***Union Pacific Railroad***

As illustrated in Confidential Appendix 8.3D, on Maps 5 and 6 of 6, the gas line would be constructed alongside the Union Pacific Railroad tracks. As described above for the Southern Pacific Railroad, only the ROW itself for the UPRR would be related to the period of significance of the UPRR (CHRIS has no records on file related to the inventory or evaluation of this railroad facility in the CPP area).

While it is possible that historic archaeological remains associated with railroad construction or operation might be discovered during construction beneath the railroad tracks, the gas line construction itself will not affect the tracks or railroad grade. Mitigation measures recommended for construction beneath the UPRR tracks are described later.

#### ***Previous Investigations (Surveys)***

Cultural resource investigation reports, relevant to the Southwest Corridor, provided by CHRIS to GANDA were also provided to CH2M HILL by CHRIS. As illustrated in Figures 8.3-2a – 8.3-2e, certain segments of the Southwest Corridor had been surveyed by previous investigations unrelated to this project. The segment of the Southwest Corridor illustrated on Map 1 of 6 has been completely surveyed previously by Maniery, Baker and Maniery (1994), and Heipel (1990). Similarly, the segment illustrated on Map 2 of 6 has been completely surveyed previously by Heipel (1990) and Peak and Associates (1981 and 1997). The segment illustrated on Map 3 of 6 has been almost completely surveyed previously by Peak and Associates (1981 and 1997) with the exception of the area shown as being surveyed in 2001 by CH2M HILL. The segment illustrated on Map 4 of 6 has been partly surveyed previously by Nelson (2000) and Peak and Associates (1979), with the balance being surveyed in 2001 by CH2M HILL. The segment illustrated on Map 5 of 6 has been only partly surveyed by Peak and Associates (1982); the majority of this segment was surveyed in 2001 by CH2M HILL. Finally, the segment illustrated on Map 6 of 6 has been only partly surveyed by Peak and Associates (1982), Ritter (1971), and Flynn (1985); the balance was surveyed in 2001 by CH2M HILL.

### 8.3.2.5.2 Field Survey

As explained immediately above, several segments of the gas line corridor have been covered by previous investigations; these segments were not re-surveyed by CH2M HILL. Those segments not otherwise surveyed previously were surveyed in 2001 by CH2M HILL (see Figures 8.3-2a-8.3-2e) employing a "complete general reconnaissance" for archaeological resources as described by King, Moratto, and Leonard (1973). The survey was completed by CH2M HILL (Dr. James C. Bard, RPA; Mr. Jim Sharpe, M.S., and Ms. Alicia Bergstad, B.S.) on July 11 and 12, 2001. With the exception of a historic archaeological site discovered just east of the Southern Pacific Railroad tracks southeast of Badger Creek (see Confidential Appendix 8.3E), no archaeological sites or isolates (prehistoric or historic) were found by CH2M HILL.

#### **Plant Site**

The proposed CPP site has been investigated by GANDA (Hart, Jenks, and Dore, 2001); SMUD has not authorized CH2M HILL to conduct any further cultural resources investigations at the plant site. Hart, Jenks, and Dore (2001) recommended further studies to determine if CA-SAC-500H and -504H meet CEQA significance criteria.

#### **Gas Line**

With one exception (an alfalfa field with zero surface visibility), all of the natural gas pipeline corridors were surveyed. With the exception of newly discovered archaeological site (see Confidential Appendix 8.3E), no archaeological sites or isolates (prehistoric or historic) were found. Figures 8.3-2a – 8.3-2e illustrate the areas surveyed by CH2M HILL and the alfalfa field not available for inspection due to lack of any surface visibility.

#### **CA-SAC-###-H (P-34-000###)**

This newly discovered archaeological site is located in the Cosumnes River Preserve; it contains both a prehistoric and historic component (see Primary Record – Confidential Appendix 8.3E). A fine grained basalt chopper was found in a dirt road in association with historic materials. This chopper is considered to be an isolated find due to the lack of any other associated prehistoric materials. It is possible, however, that additional subsurface prehistoric materials may be present. Historic era items observed included a sickle section (used to cut hay or grain), a spike tooth harrow, colored glass, burned pottery, white crockery, and the metal base of a 1901, 12-gauge Repeater shotgun shell. All historic items are visible in the dirt road. Additional cultural materials are likely to be present in the grassy areas located on both sides of the dirt road and beneath the surface. About 100 yards west of the historical items in the road are several trees near the point where the road crosses the Union Pacific Railroad Tracks. Concrete debris and an irrigation mainline ditch are present along with some chicken wire. One or more structures may have been present; at the time of this survey, ground visibility was poor due to heavy grasses. This site may be associated with the historic townsite of Arno.

#### **Archaeological High Probability Areas**

Several high probability areas (HPAs) for prehistoric and historic archaeological sites are present along the gas line corridor. Designation of HPAs is necessarily a subjective judgement on the part of CH2M HILL's cultural resource staff. HPAs are determined by the presence of known/recorded archaeological sites or the presence of terrain features believed to have been more favorable locations for prehistoric Native American occupation/use.

On Map 3 of 6, the presence of CA-SAC-68 suggests that a portion of Eschinger Road, is a HPA. This HPA continues onto Map 4 of 6 as justified by the presence of CA-SAC 93, the Arno Townsite, the newly discovered archaeological site CA-SAC-###-H, the Hicksville Cemetery, the Hicksville townsite, Arno School, and the confluence of Badger Creek and the Cosumnes River. This HPA continues onto Maps 5 and 6 of 6 as justified by the presence of Willow Creek, Laguna Creek, and Hadselville Creek.

#### **8.3.2.5.3 Architectural Reconnaissance**

Homes, farmsteads, and commercial/industrial facilities older than 45 years are potentially significant historic resources in the project area. CH2M HILL did not observe any potentially significant historic buildings or structures within the surveyed gas line corridor (which consisted of a narrow corridor immediately adjacent to paved and/or graveled roads).

#### **8.3.2.5.4 Native American Consultation**

GANDA (Hart, Jenks, and Dore, 2001) contacted the NAHC on March 22, 2001 to request information about traditional cultural properties such as cemeteries and sacred places in the CPP area. The NAHC responded that there were no known Native American sacred lands in the project area. Local Native American contacts identified by the NAHC were also notified about the project on May 4, 2001 and asked to contribute cultural resources information. One reply was received from the United Auburn Indian Community of the Auburn Rancheria (Miwok/Maidu) on May 21, 2001, which reported that the Tribal Historic Preservation Committee had no information regarding sacred sites in the project area. Another reply was received from the Ione Band of Miwok Indians on June 20, 2001 and reported that the Tribe is unaware of any information regarding existing sites in the area.

The record searches conducted at the North Central Information Center of the California Historical Resources Information System for GANDA (IC# SAC-01-29 and SAC-01-41) failed to indicate the presence of Native American traditional cultural properties.

### **8.3.3 Environmental Consequences**

This section describes the environmental consequences of proposed CPP construction.

#### **8.3.3.1 Significance Criteria**

CEQA equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment (Section 21084.1 of the Public Resources Code) and defines substantial adverse change as demolition, destruction, relocation, or alteration that would impair historical significance (Section 5020.1). Section 21084.1 stipulates that any resource listed in, or eligible for listing in, the California Register of Historical Resources<sup>4</sup> is presumed to be historically or culturally significant.<sup>5</sup>

<sup>4</sup> The California Register of Historical Resources is a listing of "... those properties which are to be protected from substantial adverse change." Any resource eligible for listing in the California Register is also to be considered under CEQA.

<sup>5</sup> A historical resource may be listed in the California Register of Historical Resources if it meets one or more of the following criteria: "(1) is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of

Resources listed in a local historic register or deemed significant in a historical resource survey (as provided under Section 5024.1g) are presumed historically or culturally significant unless the preponderance of evidence demonstrates they are not. A resource that is not listed in, or determined to be eligible for listing in the CRHR, is not included in a local register of historic resources, or not deemed significant in a historical resource survey, may nonetheless be historically significant (Section 21084.1; see Section 21098.1).

CEQA requires a Lead Agency to identify and examine environmental effects that may result in significant adverse effects. Where a project may adversely affect a unique archaeological resource,<sup>6</sup> Section 21083.2 requires the Lead Agency to treat that effect as a significant environmental effect and prepare an EIR. When an archaeological resource is listed in or is eligible to be listed in the CRHR, Section 21084.1 requires that any substantial adverse effect to that resource be considered a significant environmental effect. Sections 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. Either of these benchmarks may indicate that a project may have a potential adverse effect on archaeological resources.

### 8.3.3.2 CPP Plant Site

GANDA (Hart, Jenks, and Dore, 2001) conducted a cultural resources inventory of 220 acres at the Rancho Seco Plant for the District to assist the California Energy Commission in its compliance with the California Environmental Quality Act. As a result of their inventory, two historic period archaeological sites, CA-SAC-500H and CA-SAC-504H, and one prehistoric period archaeological resource, ARS 85-15-1, were identified. The status of the historic period archaeological resources as significant historical resources to be considered under CEQA is currently unknown. Further studies to determine if these resources meet the significance criteria are recommended by GANDA. The prehistoric archaeological resource,

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California or the United States; (2) is associated with the lives of persons important to local, California or national history; (3) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or, (4) has yielded or has the potential to yield information important in prehistory or history (. . . of the local area, California or the nation)" (Public Resources Code SS5024.1, Title 14 CCR, Section 4852). Automatic CRHR listings include National Register of Historic Places (NRHP) listed and determined eligible historic properties (either by the Keeper of the NRHP or through a consensus determination on a project review); State Historical Landmarks from number 770 onward; Points of Interest nominated from January 1998 onward. Landmarks prior to 770 and Points of Historical Interest may be listed through an action of the State Historical Resources Commission.

6. Public Resources Code 21083.2 (g) defines a unique archaeological resource to be: An archaeological artifact, object, or site, about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria: (1) contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information; (2) has a special and particular quality such as being the oldest of its type or the best available example of its type; or, (3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

ARS 85-15-1, while it has not had its significance formally evaluated, was determined not to be a significance resource by the District in 1985.

### 8.3.3.3 CPP Gas Line

The CH2M HILL field survey of those portions of the CPP gas line that were not otherwise inspected by previous investigators resulted in the discovery of an archaeological site (CA-SAC-###-H) and designation of archaeological HPAs. No historically or architecturally significant buildings or structures will be affected by gas-line construction.

### 8.3.4 Cumulative Effects

The CPP project might affect known/recorded cultural resources and subsurface archaeological resources that might be present. The significance of these known/recorded resources has not been determined and the significance of any subsurface archaeological resources that might be present is unknown. If construction was to encounter a large, stratified, buried prehistoric archaeological site, or discrete filled-in historic period features, the possibility of cumulative impacts would arise because such sites might be highly significant, and many have been destroyed or damaged by agricultural activity and/or commercial/industrial/residential development in the region. Given the relative low level of impact to such a site that the project would cause, it is also possible that proposed project activities would not lead to significant cumulative impacts, depending on the extent of project impact to any such discovered archaeological deposits. Any potential impact to an unknown site would be minimized by monitoring during construction (Section 8.3.5) and by stop-work procedures if a site were uncovered.

### 8.3.5 Mitigation Measures

CEC's cultural resource staff believe the best mitigation strategy is to avoid impact to cultural resources that may be located in a given project area. Avoidance can be accomplished by having the archaeologist and project engineer demarcate cultural resource site boundaries on the ground to ensure that proposed project improvements do not impinge on the resource(s). Where a project facility must be placed within 100 feet of a known archaeological site, the site can be temporarily fenced or otherwise marked on the ground as an Environmentally Sensitive Area (ESA). Construction equipment can then be directed away from the ESA, and construction personnel directed to avoid entering the ESA.

Prior to starting construction near a designated ESA, the construction crew should be informed of the resource values involved and of the regulatory protections afforded to the resources through an employee training program.

Though only one archaeological site was found during the survey conducted by CH2M HILL, it is possible that subsurface construction could encounter buried archaeological remains. Since several prehistoric archaeological sites have been found in the project vicinity, CH2M HILL recommends that construction monitoring take place in high probability areas and in proximity to the cultural resources listed below. In certain locations, preconstruction subsurface testing is also recommended (see below).

**TABLE 8.3-4**  
Recommended Mitigation

Cultural Resource	Mitigation Measure
Elliot Ranch	Resources not affected, no mitigation measures needed
Knopf Dairy	Resource not affected, no mitigation measures needed
CA-SAC-68	Preconstruction subsurface testing followed by construction monitoring
CA-SAC-93	Preconstruction subsurface testing followed by construction monitoring
Arno Townsite (ca. 1910)	Construction monitoring
Hicksville (1910 map)	Construction monitoring
Arno School	Avoid structure, construction monitoring
Hadselville Creek Bridge	Resource not affected, no mitigation measures needed
Western Pacific Railroad, Southern Pacific Railroad, Central California Traction Railroad, UPRR	Construction monitoring
CA-SAC-###-H (P-34-000###)	Preconstruction subsurface testing followed by construction monitoring
CA-SAC-500H and CA-SAC-504H	Avoid resources, construction monitoring
High Probability Areas	Construction monitoring

### 8.3.5.1 Pre-construction Subsurface Testing

Pre-construction testing is a form of enhanced survey in that surface survey cannot, in normal circumstances, result in reliable detection of buried archaeological sites. Subsurface testing, therefore, completes the survey by compensating for the presence of site-obscuring overburden. Pre-construction subsurface testing is recommended in the proximity of CA-SAC-68, CA-SAC-93, and newly discovered site CA-SAC-###-H.

### 8.3.5.2 Monitoring During Construction

If the CEC determines that monitoring is required, qualified personnel consisting of a Project Archaeologist (PA) and an Archaeological Monitor (AM), should conduct the required monitoring. A PA and AM can be a single person, if properly qualified. Proper qualifications for a PA are the minimum qualifications for Principal Investigator on federal projects under the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. The AM should have 5 years of experience in conducting archaeological field projects or hold a bachelor's degree in anthropology, with an emphasis in archaeology, and have at least 1 year of experience in conducting archaeological field projects. The AM should be qualified to detect archaeological deposits in the field. In addition to site detection, the PA should be qualified to evaluate the significance of the deposits, consult with regulatory agencies, and plan site evaluation and mitigation work.

To ensure participation by interested members of the Plains Miwok Indian community, it is recommended that a Plains Miwok Indian monitor be present during any needed pre-construction archaeological site testing and/or data recovery operations triggered as a consequence of archaeological remains being discovered during construction. The Plains Miwok Indian monitor can be retained either directly by the project applicant or through the subconsultant conducting the actual archaeological fieldwork.

A six-point archaeological monitoring program should be implemented as follows:

1. ***Preconstruction Assessment and Construction Training***—The PA and AM will visit the project area before construction begins to become familiar with site conditions. As construction begins, the PA will conduct a worker education session for construction supervisory personnel to explain the importance of, and legal basis for, the protection of significant archaeological resources. This worker education session can take place at the same time as the paleontological training session because both disciplines will involve the monitoring of excavation activities.
2. ***Construction Monitoring***—The AM should be present at the construction site at all times when excavation is taking place within the zone of archaeological sensitivity. The AM's role will be to watch for buried archaeological deposits during subsurface excavations.

If the AM identifies archaeological remains during construction, the AM should immediately notify the PA and site superintendent, who should halt construction in the immediate vicinity of the find, as necessary. The superintendent and AM will use flagging tape, rope, or other means to delineate the area of the find within which construction will halt. This area should include the excavation trench from which the archaeological finds came and any piles of dirt or rock spoil from that area. Construction should not take place within the delineated find area until the PA, in consultation with CEC staff, can inspect and evaluate the find.

3. ***Site Recording and Evaluation***—The PA and/or AM should follow accepted professional standards in recording any find and should submit the standard Department of Parks and Recreation (DPR) Primary Record forms (Form DPR 523) and location information to the North Central Information Center of the California Historical Resources Information System (California State University, Sacramento).

If the PA determines that the find is insignificant, construction will proceed. If the PA determines that further information is needed to evaluate significance, the CEC and SHPO will be notified, and the consultant will prepare a plan and a timetable for evaluating the find in consultation with the CEC and SHPO.

Under CEQA, a find would be considered significant (would be classified as an "important archaeological resource") if it:

- Is associated with an event or person of:
  - Recognized significance in California or American history
  - Recognized scientific importance in prehistory

- Can provide information that is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions
- Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind
- Is at least 100 years old and possesses substantial stratigraphic integrity
- Involves important research questions that historical research has shown can be answered only with archaeological methods

Under the NHPA, a find is significant if it meets the NRHP listing criteria at 36 CFR 60.4:

- The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:
  - That are associated with events that have made a significant contribution to the broad patterns of our history, or
  - That are associated with the lives of persons significant in our past, or
  - That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
  - That have yielded, or may be likely to yield, information important in prehistory or history.

If human remains are found during construction, project officials are required by the California Health and Safety Code (Section 7050.5) to contact the County Coroner. If the Coroner determines that the find is Native American, he/she must contact the NAHC. The NAHC, as required by the Public Resources Code (Section 5097.98), determines and notifies the Most Likely Descendant (MLD), and requests the MLD to inspect the burial and make recommendations for treatment or disposal.

4. **Mitigation Planning**—If the PA and the consulting parties (the CEC, SHPO, Sacramento County, NAHC-designated LD, etc.) determine that the find is significant, they should prepare and carry out a mitigation plan in accordance with state (and federal if applicable) guidelines. This plan should emphasize the avoidance, if possible, of significant archaeological resources. If avoidance is not possible, the recovery of a sample of the deposit from which the archaeologist can define scientific data to address archaeological research questions should be considered an effective mitigation measure for damage to or destruction of the deposit.

The mitigation program, if necessary, should be carried out as soon as possible to avoid construction delays. Construction should resume at the site as soon as the field data collection phase of any data recovery effort is completed. The PA will verify the

completion of field data collection by letter to the District and the CEC so that the District can resume construction.

5. *Curation*—The PA will arrange for the curation of archaeological materials collected during the monitoring and mitigation program at a qualified curation facility. A qualified curation facility is a recognized, non-profit, archaeological repository with a permanent curator. The PA shall submit field notes, stratigraphic drawings, and other materials developed as part of the archaeological excavation program to the curation facility along with the collection.
6. *Report of Findings*—If buried archaeological deposits are found during construction, the PA will prepare a report summarizing the monitoring and archaeological investigation program implemented to evaluate the find or to recover data from an archaeological site as a mitigation measure. This report should describe the site soils and stratigraphy, describe and analyze artifacts and other materials recovered, and explain the site's significance. This report should be submitted to the curation facility with the collection.

Following these mitigation measures would lower any potential project effects on archaeological resources below the threshold of significance. Though it is possible that the project would encounter significant archaeological deposits, the monitor would be present to detect, evaluate, and recover them. Therefore, monitoring and mitigation program would be effective.

Emergency maintenance and repair could cause impacts to cultural resources. In developing specific mitigative measures to address impacts for any site that cannot be avoided during construction. The potential for ongoing impacts to any resource that cannot be avoided through project redesign must be considered. Any mitigative data recovery should be properly scoped in conjunction with the appropriate agencies to address potential long-term ongoing impacts.

### 8.3.6 Involved Agencies and Agency Contacts

Table 8.3-5 lists the state agencies involved in cultural resources management for the project and a contact person at each agency. These agencies include the California NAHC and, for federal lands, the California Office of Historic Preservation.

**TABLE 8.3-5**  
Agency Contacts

Issue	Contact	Title	Telephone
Native American traditional cultural properties	Ms. Debbie Pilas-Treadway NAHC	Associate Government Program Analyst	(916) 653-4040
Federal agency NHPA Section 106 compliance	Mr. Knox Mellon California Office of Historic Preservation	SHPO	(916) 653-6624

### 8.3.7 Permits Required and Schedule

In addition to the CEC site certification, the CPP project may require federal, state or local permits that include provisions protecting cultural resources. If a CWA Section 404 permit is required for construction (wetland fills or crossings), consultation with the SHPO and ACHP (under Section 106 of the NHPA) would be required (even though no federal land is involved in the project because federal permitting or licensing requires the USACE to consider whether the project would affect historic properties listed on or meeting the criteria for listing in the NRHP).

Similarly, use of state or public lands or acquisition of discretionary development permits are subject to CEQA. Consultation with the SHPO and/or the state or local lead agency or agencies is required if the project would affect historic properties listed on or meeting the criteria for listing in the CRHR. If a previously undiscovered archaeological site is found during construction on state land, the newly discovered site would require CRHR eligibility evaluation.

If the project becomes subject to federal involvement, some or all of the following Section 106 compliance procedures would be followed as appropriate:

1. If the federal agency finds no historic properties that the undertaking might affect, the agency informs the SHPO, documents the finding, and proceeds with the undertaking.
2. If the agency finds historic properties and determines that the project would not affect them, then the agency informs the SHPO and documents the finding. The SHPO has 15 days in which to object to the finding, after which the agency may proceed with the undertaking.
3. If the agency finds historic properties that the project would affect, the agency and SHPO consult to determine whether the effect would be adverse. If the agency and SHPO find that the effect would not be adverse, the agency informs the ACHP, documents the finding, and the ACHP has 30 days in which to object to the finding. If there is no objection, the agency proceeds with the undertaking.
4. If the agency finds historic properties and determines that the project effects would be adverse, the agency and SHPO consult to determine how to mitigate these effects. This consultation culminates in a Memorandum of Agreement (MOA) between the agency, SHPO, and ACHP. The ACHP and SHPO are allotted 30 days in which to review and comment on a draft MOA. If the parties agree, the agency proceeds with the undertaking after signing and executing the MOA. If the agency does not agree to prepare an MOA, the ACHP must provide its comments on the undertaking within 60 days.

The Section 106 regulatory compliance process thus takes a minimum of 15 days if historic properties are found. This process can take from 60 to 90 days or more, depending on the complexity of the issues involved, the necessity of preparing a MOA, and other factors.

If Native American burials were discovered on federally owned land, the NAGPRA would require that the federal land management agency halt construction in the immediate vicinity of the find and contact a lineal descendant of the buried person or culturally affiliated organization. The regulations implementing NAGPRA (43 CFR 10) require that the federal

agency notify the appropriate Native American persons or organizations within 3 days of the find. These regulations also require that construction activity in the immediate vicinity of the find stop for 30 days or until a written agreement is executed to adopt a recovery plan for the treatment or removal of the human remains.

It would be incumbent upon the District and its contractors to immediately notify these federal agencies if Native American burials and/or other archaeological remains are discovered on federal land.

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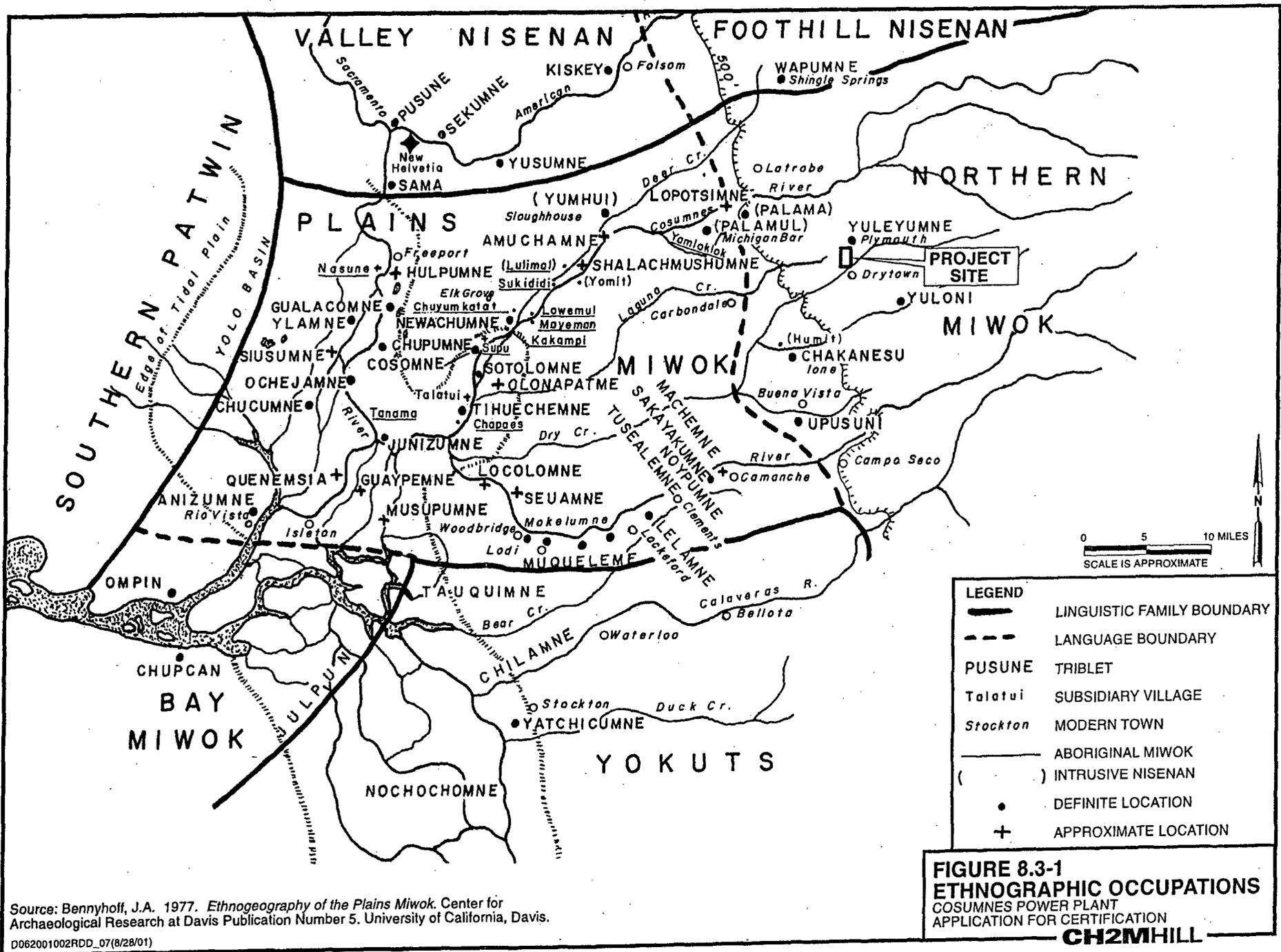
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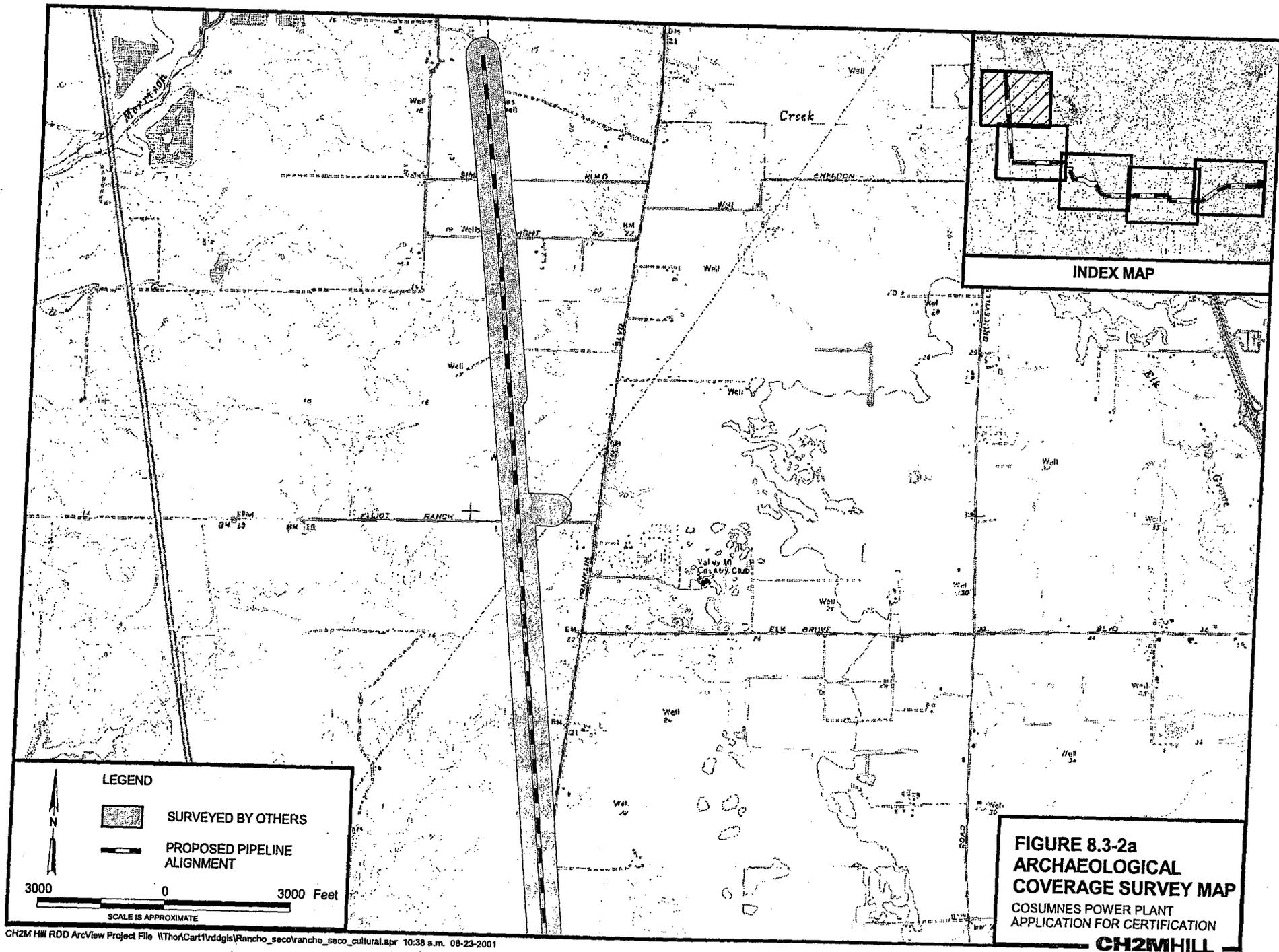
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INDEX MAP

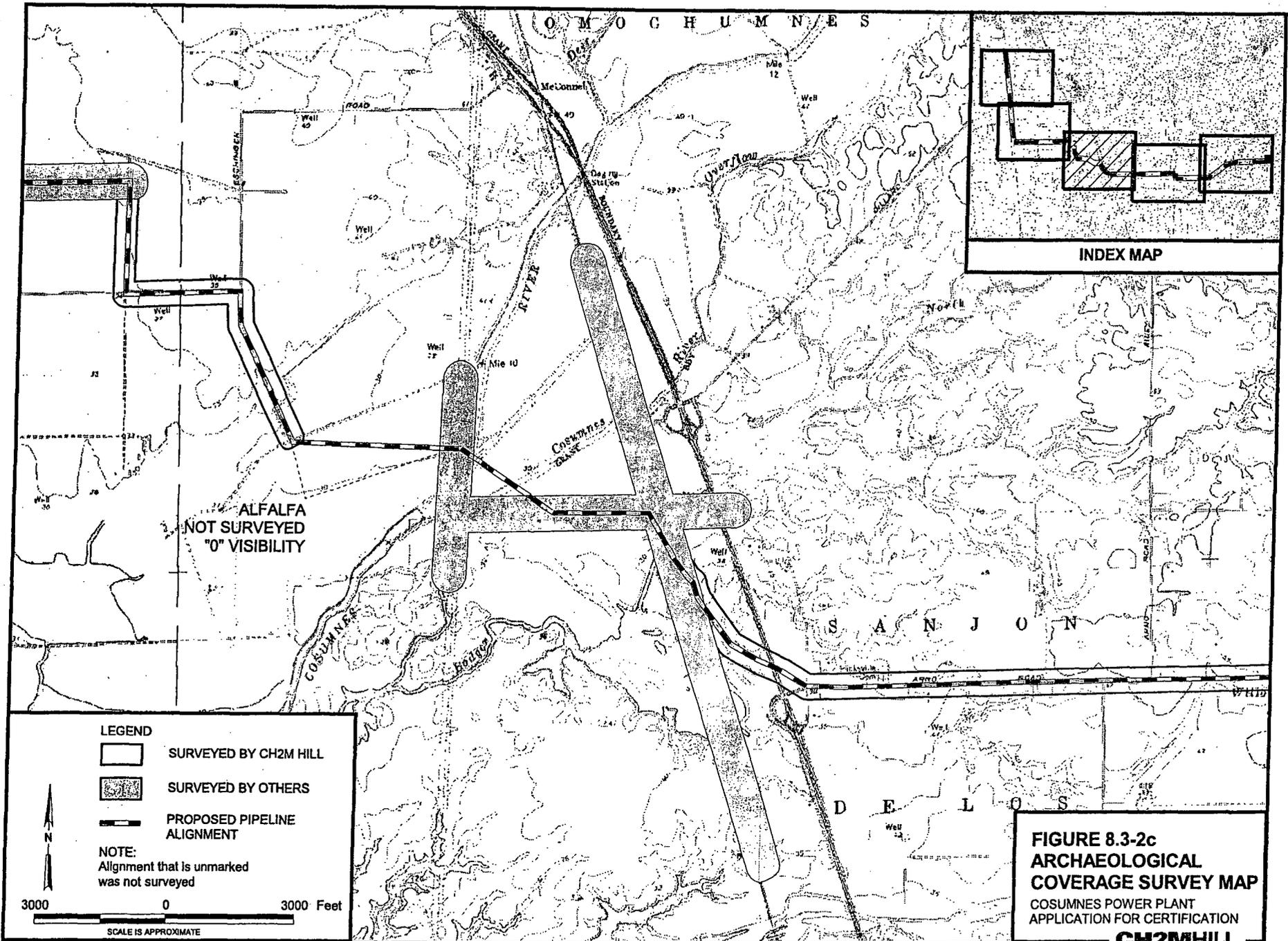
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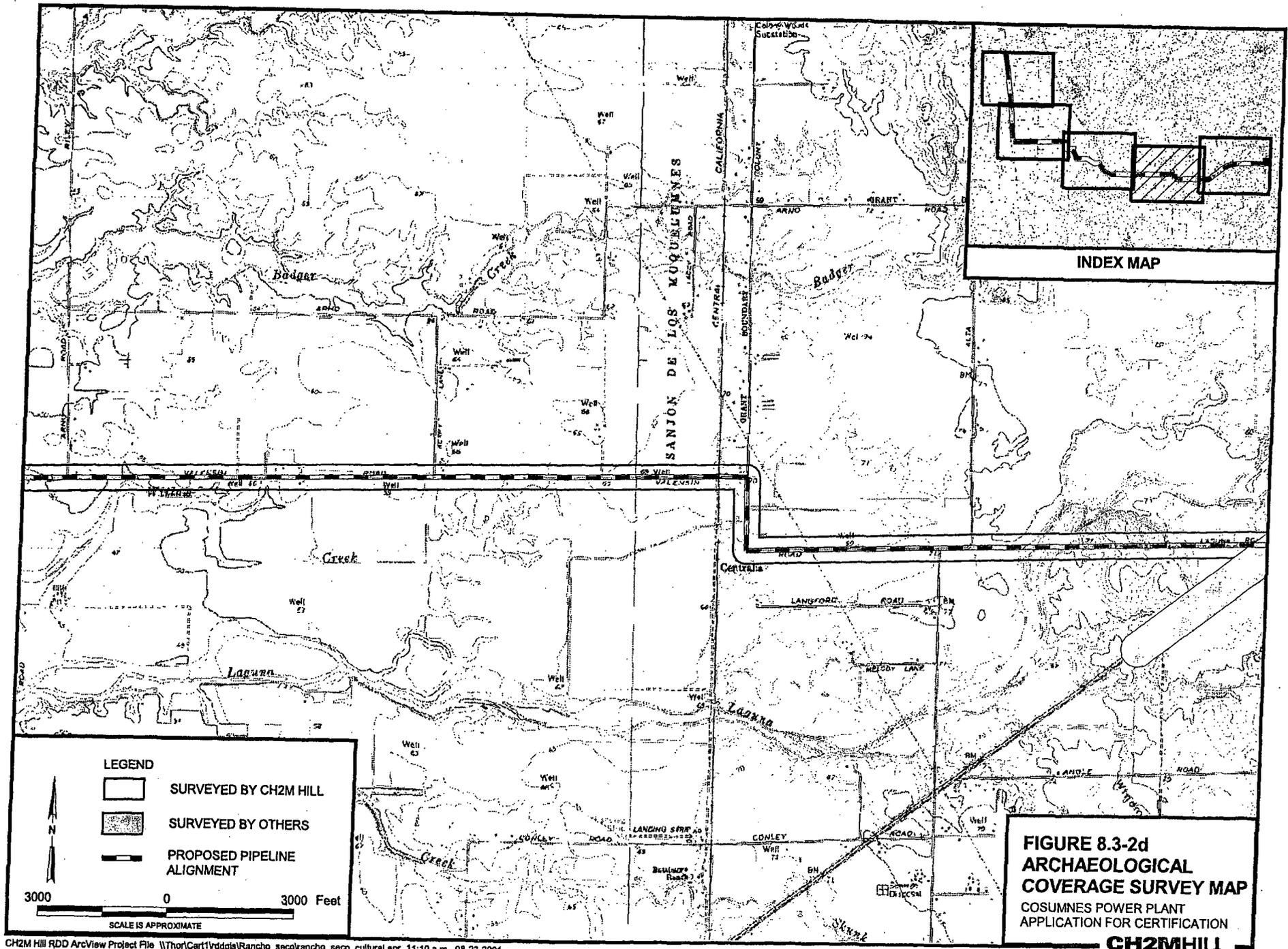
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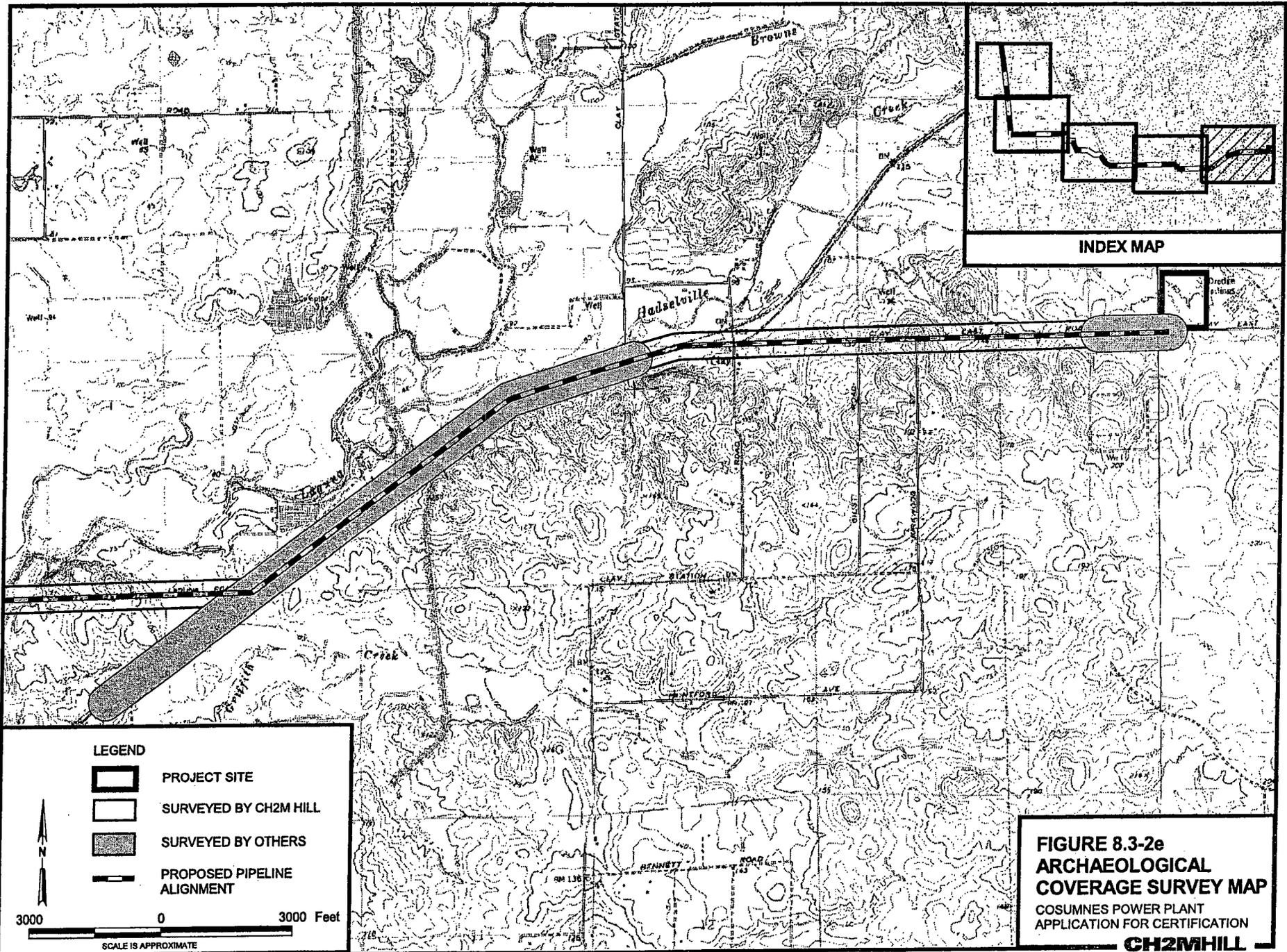
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**FIGURE 8.3-2a**  
**ARCHAEOLOGICAL**  
**COVERAGE SURVEY MAP**  
 COSUMNES POWER PLANT  
 APPLICATION FOR CERTIFICATION  
**CH2MHILL**









**CONFIDENTIAL FIGURE 8.3-3  
Known Archeological or Historical Sites**

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. 5-01-182

NPDES NO. CA0004758

WASTE DISCHARGE REQUIREMENTS  
FOR

SACRAMENTO MUNICIPAL UTILITY DISTRICT  
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1  
AND RANCHO SECO PARK  
SACRAMENTO COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

1. The Sacramento Municipal Utility District (hereafter Discharger) submitted a Report of Waste Discharge, dated 4 October 2000, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the Rancho Seco Nuclear Generating Station, Unit No. 1, Wastewater Treatment Plant. The Discharger halted nuclear power operations at Rancho Seco in June 1989. The discharge contains stormwater, irrigation runoff, processed radioactive water, treated domestic wastewater from the power plant site, and dilution water from the Folsom South Canal. The Discharger also owns and operates Rancho Seco Park. The RWD requests incorporation of land disposal requirements to the permit for domestic wastewater at the park site.
2. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides wastewater service for the closing nuclear power plant. The treatment system is in Section 29, T6N, R8E, MDB&M, as shown on Attachment A, a part of this Order. Stormwater, irrigation runoff, treated liquid radioactive wastewater, treated municipal wastewater is combined and diluted with water from the Folsom South Canal and discharged to an unnamed tributary to Clay Creek, a tributary to Hadselville Creek, Laguna Creek and the Cosumnes River, waters of the United States at the point, latitude 38°, 20', 35" (deg, min, sec) and longitude 121°, 7', 34".
3. The liquid radioactive waste treatment system consists of reverse osmosis (RO), distillation, filtration, ion exchange, regenerative hold up tanks (RHUT) and retention basins. The municipal wastewater treatment system consists of a raw sewage pump station, a package wastewater treatment plant, an aerated pond, overland flow, disinfection and dechlorination. Municipal sludge is occasionally removed from domestic wastewater system by pumping and disposed off-site at a near-by wastewater treatment plant. The Report of Waste Discharge describes the combined discharge as follows:

Total Monthly Average Flow:	12.4 million gallons per day (mgd)
Domestic wastewater Flow	0.003 mgd
Average Temperature:	73°F Summer; 57°F Winter
Total Suspended Solids	1.0 mg/l (103 lbs/day)
pH	7.0 (minimum), 9.4 (maximum)

4. The U.S. Environmental Protection Agency (EPA) and the Board have classified this discharge as a major discharge.
5. The Board adopted a Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.
6. Rancho Seco Lake is a small reservoir constructed on an unnamed tributary to Clay Creek. The source water for Rancho Seco Lake initiates from a small upstream drainage area, but principally water diversions from the Folsom South Canal. Water is regularly discharged from the Rancho Seco Lake dam spillway to maintain riparian vegetation downstream of the dam. The unnamed tributary joins Clay Creek on Rancho Seco property. The wastewater discharge point is just downstream of the confluence of the unnamed tributary and Clay Creek. The beneficial uses of Clay Creek, Hadselville Creek and Laguna Creek are not individually identified in the Basin Plan, however the Plan states; the beneficial uses of any specifically identified water body apply to its tributary streams. Upon review of the flow conditions, habitat values, and beneficial uses of Clay Creek, Hadselville Creek and Laguna Creek, the Board finds that the beneficial uses identified in the Basin Plan for the Cosumnes River are applicable to Clay Creek, Hadselville Creek and Laguna Creek. The Basin Plan at page II-2.00 states that: Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning. Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body apply to its tributary streams. The Basin Plan does not identify any beneficial uses specifically for Clay Creek, Hadselville Creek and Laguna Creek, but the Basin Plan does identify present and potential uses for the Cosumnes to which Clay Creek, via Hadselville and Laguna Creeks, is tributary. The Basin Plan identifies on Table II-1, the following beneficial uses for the Cosumnes River: municipal and domestic supply, agricultural irrigation, agricultural stock watering, body contact water recreation, canoeing and rafting, other non-body contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat and wildlife habitat. The Basin Plan defines the beneficial uses and with respect to disposal of wastewaters states that "... disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses."

The Board finds that the Beneficial Uses identified in the Basin Plan for the Cosumnes River are applicable to Clay Creek, Hadselville Creek and Laguna Creek based upon the following facts:

a. *Domestic Supply and Agricultural Supply*

The State Water Resources Control Board (SWRCB) has issued water rights to existing water users along Clay Creek, Hadselville Creek and Laguna Creek and the Cosumnes

River downstream of the discharge for domestic and irrigation uses. Since Clay Creek is an ephemeral, or low flow, stream the creek likely provides groundwater recharge during periods of low flow. The groundwater is a source of drinking water. In addition to the existing water uses, growth in the area, downstream of the discharge is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in Clay Creek, Hadselville Creek, Laguna Creek and the Cosumnes River.

b. *Water Contact and Noncontact Recreation and Esthetic Enjoyment*

The Board finds that the discharge flows through residential and agricultural areas, there is ready public access to Clay Creek, Hadselville Creek and Laguna Creek, exclusion of the public is unrealistic and contact recreational activities may currently exist along Clay Creek, Hadselville Creek and Laguna Creek and downstream waters and these uses are likely to increase as the population in the area grows. The Cosumnes River also offers recreational opportunities.

c. *Groundwater Recharge*

In areas where groundwater elevations are below the stream bottom, water from the stream will percolate to groundwater. Since Clay Creek, Hadselville Creek and Laguna Creek may at times be dry, it is reasonable to assume that the stream water is lost by evaporation, flow downstream and percolation to groundwater providing a source of municipal and irrigation water supply.

d. *Freshwater Replenishment*

When water is present in Clay Creek, Hadselville Creek and Laguna Creek, there is hydraulic continuity between the Creeks and the Cosumnes River. During periods of hydraulic continuity, the discharge adds to the water quantity and may impact the quality of water flowing down stream in the Cosumnes River.

e. *Preservation and Enhancement of Fish, Wildlife and Other Aquatic Resources.*

Clay Creek, Hadselville Creek and Laguna Creek flow to the Cosumnes River. The California Department of Fish and Game (DFG) has verified that the fish species present in the Cosumnes River are consistent with both cold and warm water fisheries and that there is a potential for anadromous fish migration necessitating a cold water. The Basin Plan (Table II-1) designates the Cosumnes River as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote (2)), the cold designation applies to Clay Creek, Hadselville Creek and Laguna Creek. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l. This approach recognizes that, if the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/l, the Discharger is not required to improve the naturally occurring level.

The beneficial uses of any specifically identified water body generally apply to its tributary streams. The Board finds that, based on hydraulic continuity, aquatic life migration, existing and potential water rights, and the reasonable potential for contact recreational activities, that the beneficial uses of the Cosumnes River apply to Clay Creek, Hadselville Creek and Laguna Creek. The Board also finds that based on the available information and on the Discharger's application, that Clay Creek, absent the discharge, is an ephemeral stream. The ephemeral nature of Clay Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within Clay Creek help support the cold-water aquatic life. Both conditions may exist within a short time span, where the Creek would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Cosumnes River. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water standards, agricultural water quality goals and aquatic life. Significant dilution may occur during and immediately following high rainfall events.

7. USEPA adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan (SIP)) which contains guidance on implementation of the NTR and the CTR. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. This Order contains provisions that:
  - a. require the Discharger to provide information as to whether the levels of EPA priority Pollutants, NTR constituents, CTR constituents, aluminum and radioactive constituents in the discharge cause or contribute to an in-stream excursion above a water quality objective;
  - b. if the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality objective, requires the Discharger to submit information to calculate effluent limitations for those constituents; and
  - c. allows the Board to reopen this Order and include effluent limitations for those constituents.
8. Section 13263.6(a), California Water Code, requires that "the regional board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that

the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRA) indicate as discharged into the POTW, for which the state board or the regional board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective”.

The Board has adopted numeric water quality objectives in the Water Quality Control Plan for the Sacramento/San Joaquin Basin (Basin Plan) for numerous constituents, for which receiving water standards have been adopted for the receiving waters involved in this discharge. As detailed elsewhere in this Permit, there is insufficient effluent quality data to determine if the constituents have a reasonable potential to cause or contribute to an excursion above any numeric water quality objectives included within the Basin Plan or in any State Board plan, so effluent limitations are not currently included in this permit pursuant to CWC Section 13263.6(a), however, if sampling reveals a reasonable potential exists, the permit may be reopened and effluent limitations added.

9. The beneficial uses of the underlying ground water are municipal and domestic, industrial service, industrial process and agricultural supply.
10. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.
11. The Discharger utilizes unlined ponds for the treatment and disposal of wastewater. Percolation is a means of wastewater disposal which could result in waste constituent migration to ground water. This permit prohibits the discharge of waste which would cause the underlying groundwater to be degraded. The Groundwater Limitations are in accordance with antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Pond Disposal Limitations have been included in the permit to assure the ponds do not cause a nuisance (odors, mosquitoes production) and that the wastewater is contained within the appropriate disposal area (minimum freeboard, flood protection).
12. The Discharger's Report of Waste Discharge characterizes the combined wastewater discharge as having a maximum pH of 9.4 pH units. The Basin Plan requires that receiving waters remain between 6.5 and 8.5 pH units. The wastewater flows dominate the low-flow streams. The Discharger claims that the elevated pH comes from ambient conditions within waters from the Folsom South Canal, which is used to dilute the combined wastewater. The discharge has caused exceedance of the Basin Plan water quality objective for pH and presents a reasonable potential to continue to cause violation of the receiving water limitation. A Cease and Desist Order has been proposed, with a time schedule for compliance, requiring compliance with this permit and the Basin Plan objective for pH.

13. The discharge of domestic and industrial wastes may include concentrations of nitrate, nitrite and ammonia. Untreated domestic wastewater contains ammonia. Ammonia is known to cause toxicity to aquatic organisms in surface waters. U.S. EPA has developed Drinking Water Standards and Ambient Water Quality Criteria for protection of human health for nitrate. Waste Discharge Requirements, Order No. 96-070, contained an effluent limitation for nitrates of 10 mg/l, which is carried forth in this permit. This permit and the Basin Plan prohibit the discharge of toxic constituents in toxic amounts and prohibit discharges that degrade receiving stream beneficial uses, including drinking water. The Basin Plan also prohibits the discharge of biostimulatory substances which promote aquatic growths in concentrations that adversely affect beneficial uses. This permit requires the Discharger to conduct a study of total nitrogen (including ammonia, nitrate and nitrite) in the discharge and allows the Board to reopen the permit and add effluent limitations if necessary to protect water quality for ammonia and total nitrogen.
14. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, the Board finds that the discharge does have a reasonable potential to cause or contribute to cause violation of the Basin Plan narrative prohibition against the discharge of toxic constituents in toxic concentrations for chlorine. U.S. EPA developed Ambient Water Quality Criteria for the Protection of Aquatic Life as recommended limitations to protect against aquatic toxicity. This Order, and the Basin Plan, prohibit the discharge of toxic constituents in toxic amounts. Chlorine is used at the wastewater treatment plant as a disinfectant and, based on experience and best professional judgment, has a reasonable potential to be discharged in toxic concentrations. An effluent limitation, based on EPA's Ambient Water Quality Criteria for the Protection of Aquatic Life, has been included in this Order to prohibit the discharge of chlorine in toxic concentrations. The total chlorine residual limitation shall be established at the point of discharge.
15. Waste Discharge Requirements, Order No. 96-070, contained effluent limitations for total dissolved solids (TDS) of 800 mg/l, as a monthly average, and 850 mg/l as a daily maximum. TDS is generally a measure of the salt concentration in the discharge. The Discharger adds chemicals, such as sodium nitrate for corrosion control, sodium hypochlorite for disinfection and for algae control in ponds, which add to the salt load in the discharge. Both the state of California and the Federal Government have adopted Secondary Maximum Contaminant Levels (MCL) for TDS of 500 to 1,000 mg/l to protect drinking water supplies. The secondary MCL has an upper limit of 1,000 mg/l and a maximum short-term concentration limit of 1,500 mg/l. Available literature indicates that irrigated agriculture is protected from salt crop damage if irrigation water remains below 700  $\mu\text{mhos/cm}$  (specific conductivity). Specific conductivity is also a measure of the salt concentration in a liquid. The annual average limitation for TDS should also be protective of irrigated agriculture. Municipal and agricultural irrigation are beneficial uses of surface waters downstream of the discharge. The TDS limitation of Order No. 96-070 has been modified to protect the secondary MCL and agricultural uses.

16. The Rancho Seco nuclear power plant is in a decommissioning mode. The nuclear fuel rods are currently stored in a spent fuel storage pool. It is the Discharger's plan to eventually move the spent nuclear rods to dry storage. Boric acid is currently added to the nuclear spent fuel storage pool to adsorb the free neutrons. Water from the spent fuel pool is treated by reverse osmosis (RO), distillation, filtering, ion exchange and/or diverted to regenerative hold-up tanks depending on the wastes present. The wastestream is then diluted with water from the Folsom South Canal, commingled with the other on-site wastestreams and discharged. The boron is treated and removed through the listed processes. The California Department of Health Services (DHS) has established a State Action Level (SAL) for boron at 1.0 mg/l based on toxicity. U.S. EPA has established a drinking water Suggested No Adverse Response Level (SNARL) for boron at 0.60 mg/l. The agricultural water quality goal is 0.70 mg/l for boron. The use of boric acid presents a reasonable potential that boron may be present in the discharge if not adequately treated and removed. To assure protection of the municipal designation of the receiving stream, an effluent limitation, based on the SNARL, has been added to the permit.
17. Reverse osmosis (RO) is one of the treatment processes utilized to treat the water from the nuclear spent fuel storage pool. RO reject water is added to other radioactive wastes, dewatered in a drum dryer, and disposed of offsite as a solid radioactive waste.
18. Water from the nuclear spent fuel pool is treated by reverse osmosis (RO), distillation, filtering, ion exchange and/or diverted to regenerative hold-up tanks depending on the wastes present. The wastestream is then diluted with water from the Folsom South Canal, commingled with the other on-site wastestreams and discharged. The discharge from the spent fuel pool is conducted on a batch basis and is not a continuous discharge. Tritium is not removed by the treatment processes and dilution is utilized for the discharge to surface waters. The Discharger is licensed by the Nuclear Regulatory Commission (NRC) to discharge radioactive material in accordance with NRC license No. DPR-54 in compliance with federal regulations 10 CFR 50 and 10 CFR 20. Effluent limitations by the NRC for nuclear materials are based on 10 CFR, Part 50, Appendix I.

The NRC liquid effluent limitations for this facility are:

- a.) The concentration of radioactive material in liquid effluents released beyond the site-boundary for liquid effluents shall not exceed the limits of 10CFR 20, appendix B, Table 2, Column 2.
- b.) Dose commitment to a member of the public at or beyond the site boundary for liquid effluents from radioactive materials shall be limited to (ODCM Technical Requirement 6.14.3, numerical guidelines of 10CFR50, Appendix I):

1.5 mrem/quarter to the total body  
5 mrem/quarter to any organ  
3 mrem/year to the total body  
10 mrem/year to any organ

WASTE DISCHARGE REQUIREMENTS ORDER NO. 5-01-182  
SACRAMENTO MUNICIPAL UTILITY DISTRICT  
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1  
AND RANCHO SECO PARK  
SACRAMENTO COUNTY

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California Code of Regulations, Title 22, Division 4 Environmental Health, Section 64443, contains primary MCLs for man-made and natural radioactivity:

Combined radium-226 and radium 228	5 pCi/l
Gross alpha particle activity	15 pCi/l
Tritium	20,000 pCi/l
Strontium-90	8 pCi/l
Gross beta particle activity	50 pCi/l
Uranium	20 pCi/l

This permit contains a Provision that requires the Discharger submit an annual report assessing compliance with the NRC liquid Effluent Limitations and allows the Board to reopen the permit and add additional effluent limitations if necessary to protect the beneficial uses of the receiving stream. The NRC limitations and the primary MCLs from Title 22 were developed to protect drinking water quality. The receiving stream and downstream waters are designated as having a municipal beneficial use. The discharge of nuclear wastes presents a reasonable potential that the discharge, if not properly treated, could degrade the beneficial use of the receiving stream. The specific constituent limitations contained in Title 22 for tritium, gross alpha particle activity and gross beta particle activity are not included in the NRC's effluent limitations. Effluent and Receiving Water limitations, based on the Title 22 MCLs, are included in the permit to protect the drinking water beneficial use. The Discharger may use sampling conducted for verification of NRC compliance to determine compliance with the Title 22 based limitations.

19. The Discharger is beginning a program for the drinking water distribution system to control corrosion and meet the drinking water standard for lead. The Discharger had proposed utilizing phosphorous for corrosion control. However, this permit and the Basin Plan prohibit the discharge of constituents that contain biostimulating substances that promotes aquatic growth in concentrations that cause nuisance or adversely affect beneficial uses. Phosphorus is the most limiting constituent for plant growth in most water bodies. Phosphorus may contribute to excessive growth of algae and may exacerbate eutrophication. Increased algae growth limits the beneficial use of Clay Creek and downstream waters. An effluent was not developed for phosphorous when the Discharger modified the corrosion control program and will not use this constituent. The addition of any chemicals, which could change the character of the wastestream would require submittal of an updated Report of Waste Discharge with possible permit modification.
20. The beneficial uses of Clay Creek, Hadselville Creek, Laguna Creek and the Cosumnes River downstream of the discharge include public contact and noncontact recreation and irrigated agriculture. To protect the beneficial use of contact recreation in a receiving stream where the following conditions exist: (1) the discharge occurs in a residential area; (2) the discharge occurs in an area where there is ready access to the stream and exclusion of the public is not realistic; (3) there have been no historical attempts to post the stream to exclude the public, however, such attempts would likely be unsuccessful; and (4) the recreation potential, and current use, in the stream is high and justified, the California Department of Health Services (DHS) recommends

municipal wastewater be treated to secondary standards if a minimum 20-to-1 (receiving stream to discharge) dilution exists or if the minimum dilution does not exist, that tertiary treatment be provided. The California Code of Regulations, Title 22, contains criteria for the reuse or reclamation of wastewater as an alternative to discharging to a receiving stream. The criteria are not directly applicable to streams that receive wastewater and the subsequent reuse of the combined stream/wastewater. Title 22 reclamation criteria were established to create minimum wastewater treatment standards to protect the public health when this water is reused for beneficial uses. The proposed permit does not apply Title 22 standards to the discharge, however, in assessing the discharge standards necessary to protect the site-specific beneficial uses of surface waters, Title 22 standards were compared to the level of treatment required to protect public health when in contact with treated wastewater or when directly using undiluted effluent for food crop irrigation. Title 22 states that it is necessary for wastewater to receive tertiary treatment for reuse as irrigation water for food crops and for unrestricted contact recreation. Clay Creek, as an intermittent or low flow stream, is essentially the same as any other conveyance system (pipe or canal) when upstream flows are not present for dilution.

The Discharger's Report of Waste Discharge reports the daily maximum domestic wastewater flow as 60,000 gallons per day (gpd), the average processed radioactive wastewater flow rate as 666,000 gpd and the dilution water from the Folsom South Canal as 10.9 million gpd. Therefore, the municipal wastewater receives a minimum 20-to-1-dilution ratio prior to being discharged from the Discharger's property and secondary treatment standards are considered adequate for the discharge. Secondary treatment standards require the discharge meet a monthly average 30 mg/l level for BOD and total suspended solids and the discharge be disinfected to 23 MPN/100 ml (monthly median). To assure that the domestic wastewater is treated to secondary treatment standards, effluent limitations must be applied prior to diluting the wastestream.

21. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.
22. The discharge is presently governed by Waste Discharge Requirements Order No. 96-070, adopted by the Board on 22 March 1996.
23. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21100, et seq.), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.
24. The Board has considered the information in the attached Information Sheet in developing the Findings of this Order. The attached Information Sheet is part of this Order.

25. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
26. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.
27. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon the date of hearing, provided EPA has no objections.

**IT IS HEREBY ORDERED** that Order No. 96-070 is rescinded and the Sacramento Municipal Utility District, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

**A. Discharge Prohibitions:**

1. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.
2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)"].
3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

**B. Domestic Effluent Limitations:**

1. Domestic Effluent, prior to dilution, shall not exceed the following limits:

<u>Constituents</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Weekly Average</u>	<u>Monthly Median</u>	<u>Annual Average</u>	<u>Daily Maximum</u>
BOD <sup>1</sup>	mg/l	30 <sup>2</sup>	45 <sup>2</sup>	---	---	60 <sup>2</sup>
	lb/Day <sup>3</sup>	15	22	---	---	30
Total Suspended Solids	mg/l	30 <sup>2</sup>	45 <sup>2</sup>	---	---	60 <sup>2</sup>
	lb/Day <sup>3</sup>	15	22			30
Total Coliform	MPN/100ml	---	---	23	---	240
Settleable Solids	ml/l					0.1
Total dissolved solids (TDS)	mg/l	1,000			500	1,500

<sup>1</sup> 5-day, 20°C biochemical oxygen demand (BOD)

<sup>2</sup> To be ascertained by a 24-hour composite

<sup>3</sup> Based upon a design treatment capacity of 0.06 mgd.

2. A minimum dilution ratio of 20-to-1 (dilution water to effluent) shall be provided prior to discharge offsite and to surface waters.
3. The arithmetic mean of 20°C BOD (5-day) and total suspended solids in effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).
4. The average dry weather discharge flow shall not exceed 36,000 gallons/day.
5. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - 70%

Median for any three or more consecutive bioassays - - - - 90%

**C. Discharge Specifications (Rancho Seco Park Land Disposal):**

1. The monthly average dry weather discharge flow shall not exceed the design capacity of the system which would result in violation of this Order and a discharge to surface waters.
2. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal.
3. As a means of discerning compliance with Discharge Specification No.2, the dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/l.
4. Ponds shall not have a pH less than 6.5 or greater than 8.5.
5. Ponds shall be managed to prevent breeding of mosquitoes. In particular,
  - a. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.
  - b. Weeds shall be minimized.
  - c. Dead algae, vegetation, and debris shall not accumulate on the water surface.
6. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.

7. Ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the nonirrigation season. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns. Freeboard shall never be less than two feet (measured vertically to the lowest point of overflow).
8. On or about **1 October** of each year, available pond storage capacity shall at least equal the volume necessary to comply with Discharge Specification 7.

**D. Combined Discharge Effluent Limitations:**

1. The total combined discharge shall not exceed the following limits:

<u>Constituents</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Weekly Average</u>	<u>3-month Average</u>	<u>Annual Average</u>	<u>Daily Maximum</u>
Total Suspended Solids (TSS)	mg/l	30	45	---	---	60
Total Chlorine	mg/l	0.01				0.02
Total Dissolved Solids (TDS)	mg/l	1,000			500	1,500
Boron	mg/l				0.60	
Tritium	pCi/l				20,000 <sup>2</sup>	
Gross beta particle activity <sup>4</sup>	pCi/l			50 <sup>3</sup>		

<sup>1</sup> 5-day, 20°C biochemical oxygen demand (BOD)

<sup>2</sup> The annual average shall be based on the average of at least four consecutive quarterly samples when discharging nuclear waste.

<sup>3</sup> The 3-month average shall be based on the average of at least three consecutive monthly samples when discharging nuclear waste. The consecutive monthly samples may not be consecutive calendar months but consecutive months when discharging.

<sup>4</sup> The Discharger shall be deemed to be in compliance with the limit for gross beta activity if the average concentration of beta particle activity and photon radioactivity from man-made radionuclides does not produce an annual dose equivalent to the total body or any internal organs greater than 4 millirems per year.

2. The discharge shall not have a pH less than 6.5 nor greater than 8.5.
3. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - 70%  
Median for any three or more consecutive bioassays - - - - 90%

**E. Sludge Disposal:**

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.
2. Any proposed change in sludge use or disposal practice from a previously approved practice shall be reported to the Executive Officer and EPA Regional Administrator at least **90 days** in advance of the change.
3. Use and disposal of sewage sludge shall comply with existing Federal and State laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

If the State Water Resources Control Board and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.

4. The Discharger is encouraged to comply with the "Manual of Good Practice for Agricultural Land Application of Biosolids" developed by the California Water Environment Association.

**F. Receiving Water Limitations:**

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit.

The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/l. The monthly median of the mean daily dissolved oxygen concentration shall not fall below 85 percent of saturation in the main water mass, and the 95<sup>th</sup> percentile concentration shall not fall below 75 percent of saturation.
2. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

3. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.
4. Esthetically undesirable discoloration.
5. Fungi, slimes, or other objectionable growths.
6. The turbidity to increase as follows:
  - a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.
  - b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.
  - c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.
  - d. More than 10 percent where natural turbidity is greater than 100 NTUs.
7. The ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 units.
8. The ambient temperature to increase more than 5°F.
9. Deposition of material that causes nuisance or adversely affects beneficial uses.
10. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
11. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.
12. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.
13. Violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder. Upon adoption of new water quality standards or objectives this Order may be reopened and modified to include additional discharge limitations.

14. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.
15. The fecal coliform concentration in any 30-day period to exceed a geometric mean of 200 MPN/100 ml or cause more than 10 percent of total samples to exceed 400 MPN/100 ml.

**G. Groundwater Limitations:**

1. The discharge shall not cause the underlying groundwater to be degraded.
2. Any increase in total coliform organisms shall not exceed a most probable number of 2.2/100 ml over any seven-day period.

**H. Provisions:**

1. All of the treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
2. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.
3. There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality objectives for: EPA priority Pollutants, National Toxics Rule constituents, California Toxics Rule constituents, aluminum and radioactive constituents. The Discharger shall comply with the following time schedule in conducting a study of these constituents potential effect in surface waters:

<u>Task</u>	<u>Compliance Date</u>
Submit Workplan and Time Schedule	<b>3-months following permit adoption</b>
Begin Study	<b>6-months following permit adoption</b>
Complete Study	<b>18-months following permit adoption</b>
Submit Study Report	<b>4-months after study completion</b>

The Discharger shall submit to the Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Board by letter when it returns to compliance with the time schedule.

If after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective this Order will be reopened and effluent limitations added for the subject constituents.

4. The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Resources Control Board, this Order may be reopened and a limitation based on that objective included.
5. The Discharger shall comply with the following time schedule to assure compliance with Finding No. 13 requiring a study of ammonia, nitrates, nitrites and total nitrogen, and the Effluent Limitation for nitrate of this Order:

<u>Task</u>	<u>Compliance Date</u>
Submit Workplan and Time Schedule	<b>3-months following permit adoption</b>
Begin Study	<b>6-months following permit adoption</b>
Complete Study	<b>18-months following permit adoption</b>
Submit Study Report	<b>4-months after study completion</b>

The Discharger shall submit to the Board on or before each compliance report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Board by letter when it returns to compliance with the time schedule. If the Board finds that ammonia and/or nitrites have a reasonable potential to cause exceedance of a water quality standard, this permit may be reopened and an effluent limitation added.

6. The Discharger is licensed by the Nuclear Regulatory Commission (NRC) to discharge radioactive material in accordance with NRC license No. DPR-54 in compliance with federal regulations 10 CFR 50 and 10 CFR 20. Effluent limitations by the NRC for nuclear materials are based on 10 CFR, Part 50, Appendix I. The Discharger shall submit an annual report assessing compliance with the NRC liquid Effluent Limitations. If the Discharger fails to comply with the NRC Limitations or additional information shows the

limitations are not adequate to protect the beneficial uses the Board may reopen the permit and add additional effluent limitations if necessary.

7. Discharge Specifications (Rancho Seco Park Land Disposal) No. 4 states that; "Ponds shall not have a pH less than 6.5 or greater than 8.5." The wastewater in the ponds has regularly exceeded a pH of 8.5 and continues to threaten to violate Discharge Specifications (Rancho Seco Park Land Disposal) No. 4. The Sacramento Municipal Utility District shall comply with the following time schedule to assure compliance with Discharge Specifications (Rancho Seco Park Land Disposal) No. 4 for pH;

Limitation

pH – greater than 6.5, less than 8.5

Compliance Date

**31 December 2003**

The Discharger shall submit to the Board on or before the compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Board by letter when it returns to compliance with the time schedule.

8. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."
9. The Discharger shall comply with Monitoring and Reporting Program No. 5-01-182, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

When requested by USEPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger Self Monitoring Reports.

10. This Order expires on **1 June 2006** and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.
11. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of, or clearance from the State Water Resources Control Board (Division of Water Rights).
12. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the

WASTE DISCHARGE REQUIREMENTS ORDER NO. 5-01-182  
SACRAMENTO MUNICIPAL UTILITY DISTRICT  
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1  
AND RANCHO SECO PARK  
SACRAMENTO COUNTY

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succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

I, GARY M. CARLTON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 14 June 2001.

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GARY M. CARLTON, Executive Officer

AMENDMENTS  
RPM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 5-01-182

NPDES NO. CA0004758

SACRAMENTO MUNICIPAL UTILITY DISTRICT  
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1  
AND RANCHO SECO PARK  
SACRAMENTO COUNTY

This Monitoring and Reporting Program is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program. Specific sample station locations shall be established under direction of the Board's staff, and a description of the stations shall be attached to this Order.

**DOMESTIC WASTEWATER INFLUENT MONITORING**

Samples shall be collected at approximately the same time as effluent samples and should be representative of the influent for the period sampled. Influent monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
20°C BOD <sub>5</sub>	mg/l, lbs/day	24-hr. Composite	Weekly
Suspended Solids	mg/l, lbs/day	24-hr. Composite	Weekly
Flow	mgd	Meter	Continuous

**DOMESTIC WASTEWATER EFFLUENT MONITORING**

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall. Effluent samples should be representative of the volume and quality of the discharge. Samples collected from the outlet structure of ponds will be considered adequately composited. Time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
20°C BOD <sub>5</sub>	mg/l, lbs/day	24-hr. Composite <sup>1</sup>	Weekly
Suspended Solids	mg/l, lbs/day	24-hr. Composite <sup>1</sup>	Weekly
Settleable Solids	ml/l	Grab	Weekly
Total Dissolved Solids	mg/l	Grab	Monthly

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Electrical Conductivity @25°C	µmhos/cm	Grab	Weekly
pH	Number	Grab	Weekly
Total Coliform Organisms	MPN/100 ml	Grab	Weekly
Flow	mgd	Meter	Continuous
Temperature	°F	Grab	Twice weekly
Ammonia	mg/l	Grab	Twice monthly
Nitrate	mg/l	Grab	Monthly

<sup>1</sup>Composite samples shall be flow proportional.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

#### TOTAL COMBINED EFFLUENT MONITORING

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall. Effluent samples should be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Suspended Solids	mg/l, lbs/day	24-hr. Composite	Weekly
Total Dissolved Solids	mg/l	Grab	Monthly
Electrical Conductivity @25°C	µmhos/cm	Grab	Weekly
pH	Number	Grab	Weekly
Total Coliform Organisms	MPN/100 ml	Grab	Weekly
Chlorine Residual	mg/l	Grab	Twice weekly

MONITORING AND REPORTING PROGRAM NO. 5-01-182  
 SACRAMENTO MUNICIPAL UTILITY DISTRICT  
 RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1  
 AND RANCHO SECO PARK  
 SACRAMENTO COUNTY

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Flow	mgd	Meter	Continuous
Temperature	°F	Grab	Twice weekly
Ammonia	mg/l	Grab	Twice monthly
Priority Pollutants	mg/l	Grab	Quarterly
Boron	mg/l	Grab	Monthly
Acute bioassay <sup>3</sup>	% survival	24-hr Composite	Quarterly
Tritium	pCi/l	24-hr Composite	Quarterly
Gross Alpha Particle Activity <sup>5</sup>	pCi/l	24-hr Composite	Monthly
Gross Beta Particle Activity <sup>5,6</sup>	pCi/l	24-hr Composite	Monthly

<sup>1</sup> Composite samples shall be flow proportional.

<sup>2</sup> Boron samples should be collected when boric acid is being used.

<sup>3</sup> The acute bioassays samples shall be analyzed using EPA/600/4-90/027F, Fourth Edition, or later amendment with Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (*Pimephales promelas*), with no pH adjustment unless approved by the Executive Officer.

<sup>4</sup> Samples for Tritium, Gross Alpha Particle Activity and Gross Beta Particle Activity shall be collected when discharging nuclear wastes.

<sup>5</sup> Gross Alpha and Beta sampling may be substituted with sampling for NRC compliance, provided that the sampling is more stringent than the required Title 22 sampling and is sufficient to determine compliance.

<sup>6</sup> The Discharger shall be deemed to be in compliance with the limit for gross beta activity if the average concentration of beta particle activity and photon radioactivity from man-made radionuclides does not produce an annual dose equivalent to the total body or any internal organs greater than 4 millirems per year.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

### RECEIVING WATER MONITORING

All receiving water samples shall be grab samples. Receiving water monitoring shall include at least the following:

<u>Station</u>	<u>Description</u>
R-1	50 feet upstream from the point of discharge
R-2	1,000 feet downstream from the point of discharge

<u>Constituents</u>	<u>Units</u>	<u>Station</u>	<u>Sampling Frequency</u>
Dissolved Oxygen	mg/l	R-1, R-2	Twice Monthly
pH	Number	R-1, R-2	Weekly
Turbidity	NTU	R-1, R-2	Weekly
Temperature	°F (°C)	R-1, R-2	Weekly
Electrical Conductivity @25°C	µmhos/cm	R-1, R-2	Weekly
Fecal Coliform Organisms	MPN/100 ml	R-1, R-2	Monthly
Ammonia <sup>1</sup>	mg/l	R-1, R-2	Monthly
Chlorine Residual	mg/l	R-1, R-2	Monthly
Radionuclides	pCi/l	R-1, R-2	Quarterly

<sup>1</sup> Temperature and pH shall be determined at the time of sample collection for the calculation of Un-ionized Ammonia

<sup>2</sup> Radionuclides shall include Tritium, Gross Alpha Particle Activity and Gross Beta Particle Activity shall be collected when discharging nuclear wastes.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-1 and R-2. Attention shall be given to the presence or absence of:

- a. Floating or suspended matter
- b. Discoloration
- c. Bottom deposits
- d. Aquatic life
- e. Visible films, sheens or coatings
- f. Fungi, slimes, or objectionable growths
- g. Potential nuisance conditions

Notes on receiving water conditions shall be summarized in the monitoring report.

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to the receiving water. The testing shall be conducted as specified in EPA 600/4-91/002, or later amendment. Chronic toxicity samples shall be collected at the discharge point prior to its entering Clay Creek. Twenty-four hour composite samples shall be representative of the volume and quality of the discharge. Time of collection samples shall be recorded. Dilution and control waters shall be obtained immediately upstream of the discharge from an area unaffected by the discharge in the receiving waters. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 14 days. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas, Ceriodaphnia dubia, and Selenastrum capricornutum*

Frequency: *Once per quarter, four quarters per year*

Dilution Series: *None*

		Creek Water	Lab Water
% WWTP Effluent	100	0	0
% Dilution Water*	0	100	0
% Lab Water	0	0	100

\* Dilution water shall be receiving water from Clay Creek taken upstream from the discharge point.

RANCHO SECO PARK POND MONITORING

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Influent flow	gpd	Metered	Weekly
Dissolved Oxygen	mg/l	Grab	Weekly
pH	pH units	Grab	Weekly
Odors	--	Observation	Weekly
Freeboard	tenths of feet	Measured	Weekly

### SLUDGE MONITORING

A composite sample of sludge shall be collected when discharged in accordance with EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989, and tested for the following metals:

Cadmium	Copper	Nickel
Chromium	Lead	Zinc

Sampling records shall be retained for a minimum of five years. A log shall be kept of sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log should be complete enough to serve as a basis for part of the annual report.

When sludge is first discharged following permit adoption, the Discharger shall submit characterization of sludge quality, including sludge percent solids and quantitative results of chemical analysis for the priority pollutants listed in 40 CFR 122 Appendix D, Tables II and III (excluding total phenols). All sludge samples shall be a composite of a minimum of twelve (12) discrete samples taken at equal time intervals over 24 hours. Suggested methods for analysis of sludge are provided in EPA publications titled "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods" and "Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater". Recommended analytical holding times for sludge samples should reflect those specified in 40 CFR 136.6.3(e). Other guidance is available in EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989.

### WATER SUPPLY (Folsom South Canal) MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following:

Constituents	Units	Sampling Frequency
Electrical Conductivity <sup>1</sup> @ 25°C	µmhos/cm	Monthly
Total Dissolved Solids	mg/l	Monthly
pH	pH units	Monthly
Temperature	°F	Monthly

## REPORTING

Monitoring results shall be submitted to the Regional Board by the **first day** of the second month following sample collection. Quarterly and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter, semi-annual period, and year**, respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and removal efficiencies (%) for BOD and Suspended Solids, should be determined and recorded.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **30 January** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

- a. The names, certificate grades, and general responsibilities of all persons employed at the WWTP (Standard Provision A.5).
- b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.
- c. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).
- d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

The Discharger may also be requested to submit an annual report to the Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

MONITORING AND REPORTING PROGRAM NO. 5-01-182  
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AND RANCHO SECO PARK  
SACRAMENTO COUNTY

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All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

Ordered by: \_\_\_\_\_  
GARY M. CARLTON, Executive Officer

\_\_\_\_\_  
14 June 2001

(Date)

RPM

## INFORMATION SHEET

ORDER NO. 5-01-182  
SACRAMENTO MUNICIPAL UTILITY DISTRICT  
RANCHO SECO NUCLEAR GENERATING STATION, UNIT 1  
AND RANCHO SECO PARK  
SACRAMENTO COUNTY

The Sacramento Municipal Utility District owns and operates the Rancho Seco Nuclear Generating Station, Unit No. 1, Wastewater Treatment Plant. The Discharger halted nuclear power operations at Rancho Seco in June 1989. The discharge contains stormwater, irrigation runoff, processed radioactive water, treated domestic wastewater from the power plant site and dilution water from the Folsom South Canal. The Discharger also owns and operates Rancho Seco Park. Stormwater, irrigation runoff, treated liquid radioactive wastewater and treated municipal wastewater is combined and diluted with water from the Folsom South Canal and discharged to an unnamed tributary to Clay Creek, a tributary to Hadselville Creek, Laguna Creek and the Cosumnes River. Stormwater will be regulated under a separate General Stormwater permit for industrial activities.

The liquid radioactive waste treatment system consists of reverse osmosis (RO), distillation, filtration, ion exchange, regenerative hold up tanks (RHUT) and retention basins. The municipal wastewater treatment system consists of a raw sewage pump station, a package wastewater treatment plant, an aerated pond, overland flow, disinfection and dechlorination. Municipal sludge is occasionally removed from domestic wastewater system by pumping and disposed off-site at a near-by wastewater treatment plant.

Rancho Seco Lake is a small reservoir constructed on an unnamed tributary to Clay Creek. The source water for Rancho Seco Lake initiates from a small upstream drainage area, but principally water diversions from the Folsom South Canal. Water is regularly discharged from the Rancho Seco Lake dam spillway to maintain riparian vegetation downstream of the dam. The unnamed tributary joins Clay Creek on Rancho Seco property. The wastewater discharge point is just downstream of the confluence of the unnamed tributary and Clay Creek. The beneficial uses of Clay Creek, Hadselville Creek and Laguna Creek are not individually identified in the Basin Plan, however the Plan states "The beneficial uses of any specifically identified water body generally apply to its tributary streams." Upon review of the flow conditions, habitat values, and beneficial uses of Clay Creek, Hadselville Creek and Laguna Creek, the Board finds that the beneficial uses identified in the Basin Plan for the Cosumnes River are applicable to Clay Creek, Hadselville Creek and Laguna Creek. The Basin Plan at page II-2.00 states that: "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning. Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams. In some cases a beneficial use may not be applicable to the entire body of water. In these cases the Regional Board's judgment will be applied. It should be noted that it is impractical to list every surface water in the Region in the Basin Plan. For unidentified water bodies, the beneficial uses will be evaluated on a case-by-

case basis.” The Basin Plan does not identify any beneficial uses specifically for Clay Creek, Hadselville Creek and Laguna Creek, but the Basin Plan does identify present and potential uses for the Cosumnes to which Clay Creek, via Hadselville and Laguna Creeks, is tributary. The Basin Plan identifies the following beneficial uses for the Cosumnes River: municipal and domestic supply, agricultural irrigation, agricultural stock watering, body contact water recreation, canoeing and rafting, other non-body contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat and wildlife habitat. The Basin Plan defines the beneficial uses and with respect to disposal of wastewaters states that “... disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.”

The Beneficial Uses identified in the Basin Plan for the Cosumnes River are applicable to Clay Creek, Hadselville Creek and Laguna Creek based upon the following facts:

a. *Domestic Supply and Agricultural Supply*

*The State Water Resources Control Board (SWRCB) has issued water rights to existing water users along Clay Creek, Hadselville Creek and Laguna Creek and the Cosumnes River downstream of the discharge for domestic and irrigation uses. Since Clay Creek is an ephemeral, or low flow, stream the creek likely provides groundwater recharge during periods of low flow. The groundwater is a source of drinking water. In addition to the existing water uses, growth in the area, downstream of the discharge is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in Clay Creek, Hadselville Creek, Laguna Creek and the Cosumnes River.*

b. *Water Contact and Noncontact Recreation and Esthetic Enjoyment*

*The Board finds that the discharge flows through residential and agricultural areas, there is ready public access to Clay Creek, Hadselville Creek and Laguna Creek, exclusion of the public is unrealistic and contact recreational activities may currently exist along Clay Creek, Hadselville Creek and Laguna Creek and downstream waters and these uses are likely to increase as the population in the area grows. The Cosumnes River also offers recreational opportunities.*

c. *Groundwater Recharge*

*In areas where groundwater elevations are below the stream bottom, water from the stream will percolate to groundwater. Since Clay Creek, Hadselville Creek and Laguna Creek may at times be dry, it is reasonable to assume that the stream water is lost by evaporation, flow downstream and percolation to groundwater providing a source of*

*municipal and irrigation water supply.*

d. *Freshwater Replenishment*

*When water is present in Clay Creek, Hadselville Creek and Laguna Creek, there is hydraulic continuity between the Creeks and the Cosumnes River. During periods of hydraulic continuity, the discharge adds to the water quantity and may impact the quality of water flowing down stream in the Cosumnes River.*

e. *Preservation and Enhancement of Fish, Wildlife and Other Aquatic Resources.*

*Clay Creek, Hadselville Creek and Laguna Creek flow to the Cosumnes River. The California Department of Fish and Game (DFG) has verified that the fish species present in the Cosumnes River consistent with both cold and warm water fisheries, that there is a potential for anadromous fish migration necessitating a cold water. The Basin Plan (Table II-1) designates the Cosumnes River as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote (2)), the cold designation applies to Clay Creek, Hadselville Creek and Laguna Creek. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l. This approach recognizes that, if the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/l, the Discharger is not required to improve the naturally occurring level.*

The beneficial uses of any specifically identified water body generally apply to its tributary streams. Based on hydraulic continuity, aquatic life migration, existing and potential water rights, and the reasonable potential for contact recreational activities, that the beneficial uses of the Cosumnes River apply to Clay Creek, Hadselville Creek and Laguna Creek. The Board also finds that based on the available information and on the Discharger's application, that Clay Creek, absent the discharge, is an ephemeral stream. The ephemeral nature of Clay Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within Clay Creek help support the cold-water aquatic life. Both conditions may exist within a short time span, where the Creek would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Cosumnes River. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water standards, agricultural water quality goals and aquatic life. Significant dilution may occur during and immediately following high rainfall events.

USEPA adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan (SIP)) which contains guidance on implementation of the NTR and the CTR. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. This Order contains provisions that require the Discharger to provide information as to whether the levels of EPA priority Pollutants, NTR constituents, CTR constituents, aluminum and radioactive constituents in the discharge cause or contribute to an in-stream excursion above a water quality objective and allows the Board to reopen the permit and include effluent limitations for those constituents.

The beneficial uses of the underlying ground water are municipal and domestic, industrial service, industrial process and agricultural supply. The Discharger utilizes unlined ponds for the treatment and disposal of wastewater. Percolation is a means of wastewater disposal which could result in waste constituent migration to ground water. The permit prohibits the discharge of waste which would cause the underlying groundwater to be degraded. The Groundwater Limitations are in accordance with antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Pond Disposal Limitations have been included in the permit to assure the ponds do not cause a nuisance (odors, mosquitoes production) and that the wastewater is contained within the appropriate disposal area (minimum freeboard, flood protection).

The Discharger's Report of Waste Discharge characterizes the combined wastewater discharge as having a maximum pH of 9.4 pH units. The Basin Plan requires that receiving waters remain between 6.5 and 8.5 pH units. The U.S. EPA recommends that pH levels be maintained below 9.0 to protect freshwater aquatic life. The wastewater flows dominate the low-flow streams. The Discharger claims that the elevated pH comes from ambient conditions within waters from the Folsom South Canal, which is used to dilute the combined wastewater. The discharge has caused exceedance of the Basin Plan water quality objective for pH and presents a reasonable potential to continue to cause violation of the receiving water limitation. A Cease and Desist Order has been proposed, with a time schedule for compliance, requiring compliance with the permit and the Basin Plan objective for pH. A provision has also been included in the permit to require compliance with the pH limitation for the pond disposal system at Rancho Seco Park.

The discharge of domestic and industrial wastes may include concentrations of nitrate, nitrite and ammonia. Untreated domestic wastewater contains ammonia. Ammonia is known to cause toxicity to aquatic organisms in surface waters. U.S. EPA has developed Drinking Water Standards and Ambient Water Quality Criteria for protection of human health for nitrate. Waste Discharge Requirements, Order No. 96-070, contained an effluent limitation for nitrates of

10 mg/l, which is carried forth in this permit. This permit and the Basin Plan prohibit the discharge of toxic constituents in toxic amounts and prohibit discharges that degrade receiving stream beneficial uses, including drinking water. The Basin Plan also prohibits the discharge of biostimulatory substances which promote aquatic growths in concentrations that adversely affect beneficial uses. This permit requires the Discharger to conduct a study of total nitrogen (including ammonia, nitrate and nitrite) in the discharge and allows the Board to reopen the permit and add effluent limitations if necessary to protect water quality for ammonia and total nitrogen.

Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, the Board finds that the discharge does have a reasonable potential to cause or contribute to cause violation of the Basin Plan narrative prohibition against the discharge of toxic constituents in toxic concentrations for chlorine. U.S. EPA developed Ambient Water Quality Criteria for the Protection of Aquatic Life as recommended limitations to protect against aquatic toxicity. This Order, and the Basin Plan, prohibit the discharge of toxic constituents in toxic amounts. Chlorine is used at the wastewater treatment plant as a disinfectant and, based on experience and best professional judgment, has a reasonable potential to be discharged in toxic concentrations. An effluent limitation, based on EPA's Ambient Water Quality Criteria for the Protection of Aquatic Life, has been included in this Order to prohibit the discharge of chlorine in toxic concentrations. The total chlorine residual limitation shall be established at the point of discharge.

Waste Discharge Requirements, Order No. 96-070, contained effluent limitations for total dissolved solids (TDS) of 800 mg/l, as a monthly average, and 850 mg/l as a daily maximum. TDS is generally a measure of the salt concentration in the discharge. The Discharger adds chemicals, such as sodium nitrate for corrosion control, sodium hypochlorite for disinfection and for algae control in ponds, which add to the salt load in the discharge. Both the state of California and the Federal Government have adopted Secondary Maximum Contaminant Levels (MCL) for TDS of 500 to 1,000 mg/l to protect drinking water supplies. The secondary MCL has an upper limit of 1,000 mg/l and a maximum short-term concentration limit of 1,500 mg/l. Available literature indicates that irrigated agriculture is protected from salt crop damage if irrigation water remains below 700  $\mu$ mhos/cm (specific conductivity). Specific conductivity is also a measure of the salt concentration in a liquid. Municipal and agricultural irrigation are beneficial uses of surface waters downstream of the discharge. The TDS limitation of Order No. 96-070 has been modified to protect the secondary MCL and agricultural uses of the receiving stream.

The Rancho Seco nuclear power plant is in a decommissioning mode. The nuclear fuel rods are currently stored in a spent fuel storage pool. It is the Discharger's plan to eventually move the spent nuclear rods to dry storage. Boric acid is currently added to the nuclear spent fuel storage

pool to adsorb the free neutrons. Water from the spent fuel pool is treated by reverse osmosis (RO), distillation, filtering, ion exchange and/or diverted to regenerative hold-up tanks depending on the wastes present. The wastestream is then diluted with water from the Folsom South Canal, commingled with the other on-site wastestreams and discharged. The boron is treated and removed through the listed processes. The California Department of Health Services (DHS) has established a State Action Level (SAL) for boron at 1.0 mg/l based on toxicity. U.S. EPA has established a drinking water Suggested No Adverse Response Level (SNARL) for boron at 0.60 mg/l. The agricultural water quality goal is 0.70 mg/l for boron. The use of boric acid presents a reasonable potential that boron may be present in the discharge if not adequately treated and removed. To assure protection of the municipal designation of the receiving stream, an effluent limitation, based on the SNARL, has been added to the permit.

Reverse osmosis (RO) is one of the treatment processes utilized to treat the water from the nuclear spent fuel storage pool. RO reject water is added to other radioactive wastes, dewatered in a drum dryer, and disposed of offsite as a solid radioactive waste.

Water from the nuclear spent fuel pool is treated by reverse osmosis (RO), distillation, filtering, ion exchange and/or diverted to regenerative hold-up tanks depending on the wastes present. The wastestream is then diluted with water from the Folsom South Canal, commingled with the other on-site wastestreams and discharged. The discharge from the spent fuel pool is conducted on a batch basis and is not a continuous discharge. Tritium is not removed by the treatment processes and dilution is utilized for the discharge to surface waters. The Discharger is licensed by the Nuclear Regulatory Commission (NRC) to discharge radioactive material in accordance with NRC license No. DPR-54 in compliance with federal regulations 10 CFR 50 and 10 CFR 20. Effluent limitations by the NRC for nuclear materials are based on 10 CFR, Part 50, Appendix I.

The NRC liquid effluent limitations for this facility are:

- a.) The concentration of radioactive material in liquid effluents released beyond the site-boundary for liquid effluents shall not exceed the limits of 10CFR 20, appendix B, Table 2, Column 2.
- b.) Dose commitment to a member of the public at or beyond the site boundary for liquid effluents from radioactive materials shall be limited to (ODCM Technical Requirement 6.14.3, numerical guidelines of 10CFR50, Appendix I):

1.5 mrem/quarter to the total body  
5 mrem/quarter to any organ  
3 mrem/year to the total body  
10 mrem/year to any organ

California Code of Regulations, Title 22, Division 4 Environmental Health, Section 64443, contains primary MCLs for man-made and natural radioactivity:

Combined radium-226 and radium 228	5 pCi/l
Gross alpha particle activity	15 pCi/l
Tritium	20,000 pCi/l
Strontium-90	8 pCi/l
Gross beta particle activity	50 pCi/l
Uranium	20 pCi/l

The permit contains a Provision that requires the Discharger submit an annual report assessing compliance with the NRC liquid Effluent Limitations and allows the Board to reopen the permit and add additional effluent limitations if necessary to protect the beneficial uses of the receiving stream. The NRC limitations and the primary MCLs from Title 22 were developed to protect drinking water quality. The receiving stream and downstream waters are designated as having a municipal beneficial use. The discharge of nuclear wastes presents a reasonable potential that the discharge, if not properly treated, could degrade the beneficial use of the receiving stream. The specific constituent limitations contained in Title 22 for tritium, gross alpha particle activity and gross beta particle activity are not included in the NRC's effluent limitations. Effluent and Receiving Water limitations, based on the Title 22 MCLs, are included in the permit to protect the drinking water beneficial use.

The Discharger is beginning a program for the drinking water distribution system to control corrosion and meet the drinking water standard for lead. The Discharger had proposed utilizing phosphorous for corrosion control. However, this permit and the Basin Plan prohibit the discharge of constituents that contain biostimulating substances that promotes aquatic growth in concentrations that cause nuisance or adversely affect beneficial uses. Phosphorus is the most limiting constituent for plant growth in most water bodies. Phosphorus may contribute to excessive growth of algae and may exacerbate eutrophication. Increased algae growth limits the beneficial use of Clay Creek and downstream waters. An effluent was not developed for phosphorous when the Discharger modified the corrosion control program and will not use this constituent. The addition of any chemicals, which could change the character of the wastestream would require submittal of an updated Report of Waste Discharge with possible permit modification.

The beneficial uses of Clay Creek, Hadselville Creek, Laguna Creek and the Cosumnes River downstream of the discharge include public contact and noncontact recreation and irrigated agriculture. To protect the beneficial use of contact recreation in a receiving stream where the following conditions exist: (1) the discharge occurs in a residential area; (2) the discharge occurs in an area where there is ready access to the stream and exclusion of the public is not realistic; (3) there have been no historical attempts to post the stream to exclude the public, however, such attempts would likely be unsuccessful; and (4) the recreation potential, and current use, in the

stream is high and justified, the California Department of Health Services (DHS) recommends municipal wastewater be treated to secondary standards if a minimum 20-to-1 (receiving stream to discharge) dilution exists or if the minimum dilution does not exist, that tertiary treatment be provided. The California Code of Regulations, Title 22, contains criteria for the reuse or reclamation of wastewater as an alternative to discharging to a receiving stream. The criteria are not directly applicable to streams that receive wastewater and the subsequent reuse of the combined stream/wastewater. Title 22 reclamation criteria were established to create minimum wastewater treatment standards to protect the public health when this water is reused for beneficial uses. The proposed permit does not apply Title 22 standards to the discharge, however, in assessing the discharge standards necessary to protect the site-specific beneficial uses of surface waters, Title 22 standards were compared to the level of treatment required to protect public health when in contact with treated wastewater or when directly using undiluted effluent for food crop irrigation. Title 22 states that it is necessary for wastewater to receive tertiary treatment for reuse as irrigation water for food crops and for unrestricted contact recreation. Clay Creek, as an intermittent or low flow stream, is essentially the same as any other conveyance system (pipe or canal) when upstream flows are not present for dilution.

The Discharger's Report of Waste Discharge reports the daily maximum domestic wastewater flow as 60,000 gallons per day (gpd), the average processed radioactive wastewater flow rate as 666,000 gpd and the dilution water from the Folsom South Canal as 10.9 million gpd. Therefore, the municipal wastewater receives a minimum 20-to-1-dilution ratio prior to being discharged from the Discharger's property and secondary treatment standards are considered adequate for the discharge. Secondary treatment standards require the discharge meet a monthly average 30 mg/l level for BOD and total suspended solids and the discharge be disinfected to 23 MPN/100 ml (monthly median). To assure that the domestic wastewater is treated to secondary treatment standards, effluent limitations must be applied prior to diluting the wastestream.

RPM

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MPC&D 05-121

November 30, 2005

Mr. Thomas R. Pinkos  
Executive Officer  
California Regional Water Quality Control Board  
Central Valley Region  
11020 Sun Center Drive #200  
Rancho Cordova, CA 95670-6114

**APPLICATION FOR RENEWAL OF RANCHO SECO WASTE DISCHARGE  
REQUIREMENTS (NPDES NO. CA0004758)**

Dear Mr. Pinkos:

The Sacramento Municipal Utility District (the District) hereby submits the enclosed NPDES permit renewal application for your review (CRWQCB Form 200, EPA Forms 1 and 2C).

The District permanently halted nuclear power operations at Rancho Seco in June 1989 and began Decommissioning in 1997. The spent nuclear fuel is stored in a dry storage facility licensed by the Nuclear Regulatory Commission (NRC) (license SNM 2510). Most of the Reactor and Steam system components and piping have been removed during Decommissioning. At this time, the District expects to complete Decommissioning of radioactive components in 2008. Decommissioning of non-radioactive components and structures will continue past 2008. The Decommissioning has resulted in the continued removal of support systems and has impacted or will impact the Rancho Seco wastewater discharge as follows:

**Changes**

1. The Regenerative Hold Up Tanks (RHUTs) have been removed from the radioactive liquid processing system. Radioactive water continues to be processed using the Retention Basins. The RHUTs are identified in Order No. 5-01-182 on page 1, paragraph 3. The District requests that the reference to the RHUTs either be removed from the District's new permit or, alternatively, that a change be made to the new permit noting that the RHUTs have been removed.
2. The spent nuclear fuel is stored in dry storage at the ISFSI at the Rancho Seco site. Water from the spent fuel storage pool has been processed through the radioactive liquid waste system and the spent fuel storage pool has been decommissioned. The District requests that the new permit reflect that the spent fuel storage pool has been decommissioned.

3. In accordance with Cease and Desist Order No. 5-01-183, the District installed a CO<sub>2</sub> Injection System for the purpose of pH control.

### Trends

1. The Decommissioning project has reduced the volume of radioactive liquid waste generated. As a result, the District has consolidated and removed liquid radioactive waste tanks and decreased the number of batch releases of radioactive water. The radioactive water continues to be processed through the Retention Basins, and may receive Sodium Hypochlorite for algae control and acid/caustic for pH control. In accordance with the facility's Nuclear Regulatory Commission license (DPR-54), processing (dependent on characteristics) may include: reverse osmosis, ion exchange, distillation, filtration, sedimentation, cyclone separation, and dilution.
2. The drinking water system at Rancho Seco has implemented a corrosion control program in response to exceeding the first draw Lead action level (Title 22, California Code of Regulations). The program includes injection of sodium silicate into the drinking water system.
3. The fire protection water system draws water from the plant supply water system. The diesel fire pump operates for 30 min/week and when activated by the fire protection system sensors. The electric fire pump operates when activated by the fire protection system sensors. Each fire pump discharges 2000 gpm when operating.
4. Rancho Seco continues to operate the sewage treatment plant in a manner that usually produces no discernible discharge during the warmer months (e.g., May - October).

### Planned Changes

1. The Reactor Cavity is filled with approximately 450,000 gallons of water in support of the Reactor Internals cutting project. The water contains residual Boron (1400 µg/L). The water will be processed through the radioactive water processing system once the Reactor Internals cutting project is completed. The District expects to complete this project by June 2006. No other water containing Boron is expected after this project.
2. The Reactor Vessel cutting project will commence after the Reactor Internals cutting is complete. The current plan for cutting the Reactor Vessel is to use a high-pressure water jet with abrasive media. The water will be processed through radioactive water processing systems. The Reactor Vessel cutting project is expected to be complete by January 2007.
3. The District intends to cease discharges of radioactive water prior to 2008. Following the completion of the Reactor Vessel cutting project the District expects to cease generating large quantities of radioactive water. This will allow the District to decommission the radioactive water processing systems, including the Retention

Basins, sumps, and associated piping. The current plan is to install temporary tanks to replace the Retention Basins. The temporary tanks will be removed from service when discharge of radioactive water ceases.

4. The planned reduction in personnel following radioactive decommissioning in 2008 will impact the operation of the sewage treatment system. The District plans to cease operating the current sewage treatment system, and install a system that will not require discharges to surface waters.

### Change Request

1. The District requests that the Combined Discharge Effluent Limitation for Boron be deleted from the District's next permit. The District no longer uses Boric Acid and is scheduled to process the remaining water with residual Boron by June 2006.
2. The District requests that the Receiving Water Limitation related to California Code of Regulations (CCR) Title 22 maximum contaminate levels for Radionuclide concentration be continued from the current permit. The CCR Title 22 maximum contaminate level is based on an individual ingesting 2 liters per day for 365 days which would result in a whole body dose of 4 mrem per year. Radioactive concentrations in Rancho Seco's discharges are governed by the District's Nuclear Regulatory Commission license DPR-54 and are based on exposure pathways from actual uses of the Rancho Seco discharge determined by a land use census. The radiological effluent program controls the Radionuclide concentration based upon the cumulative dose from all Radionuclides released using the following limits; (1) whole body dose 1.5 mrem per quarter or 3 mrem per year, and (2) dose to any organ 5 mrem per quarter or 10 mrem per year to ensure compliance with 10CFR50. The District welcomes discussion with members of your staff regarding this issue.
3. The District requests that the Receiving Water Limitation related to changing the ambient pH by more than 0.5 units be deleted from the District's next permit.
4. The District requests that the Combined Discharge Effluent monitoring requirement for priority pollutants be removed from the District's next permit. The District has performed this monitoring in accordance with the current Order and believes that the discharge does not cause or have reasonable potential to cause an in-stream excursion above a water quality objective. The District welcomes discussion with members of your staff regarding this issue.

Additional comments to assist in your review of the enclosed application are as follows:

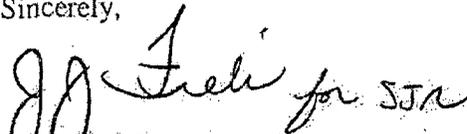
1. EPA Form 2C Section V Part B j. Radioactivity

*Radioactivity* – The requested radioactivity analytical data does not accurately reflect the radioactive characteristics of the Rancho Seco discharge. Rancho Seco is licensed by the Nuclear Regulatory Commission (NRC) to discharge radioactivity in accordance with NRC license DPR-54. In accordance with applicable regulations, the District produces an Annual Radioactive Effluent Release Report that more accurately details the radioactive characteristics of Rancho Seco wastewater discharges. Enclosed are the pertinent pages of the last Annual report.

The District requests the opportunity to review an administrative copy of the draft permit as soon as it is available.

Members of your staff requiring additional information or clarification may contact Mr. Brad Gacke at (916) 732-4812.

Sincerely,

A handwritten signature in cursive script, appearing to read "Steve Redeker for SJR".

Steve Redeker, Manager  
Plant Closure and Decommissioning

Enclosure

Cc w/Encls: Patricia Leary, California Regional Water Quality Control Board, Central Valley Region

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY



State of California  
Regional Water Quality Control Board  
**APPLICATION/REPORT OF WASTE DISCHARGE  
GENERAL INFORMATION FORM FOR  
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT**



**I. FACILITY INFORMATION**

**A. Facility:**

Name: Rancho Seco Nuclear Generating Station, Unit 1 and Rancho Seco Park.			
Address: 14440 Twin Cities Road			
City: Herald	County: Sacramento	State: CA	Zip Code: 95638
Contact Person: Brad Gacke		Telephone Number: (916) 732-4812	

**B. Facility Owner:**

Name: Sacramento Municipal Utility District			Owner Type (Check One)	
Address: 6201 S Street			1. <input type="checkbox"/> Individual	2. <input type="checkbox"/> Corporation
City: Sacramento	State: CA	Zip Code: 95817	3. <input type="checkbox"/> Governmental Agency	4. <input type="checkbox"/> Partnership Agency
Contact Person: Steven Redeker, Manager Plant Closure & Decommissioning			5. <input checked="" type="checkbox"/> Other: <u>Municipality</u>	
		Telephone Number: (916) 732-4827	Federal Tax ID: 94-6001157	

**C. Facility Operator (The agency or business, not the person):**

Name: Same as Owner			Operator Type (Check One)	
Address:			1. <input type="checkbox"/> Individual	2. <input type="checkbox"/> Corporation
City:	State:	Zip Code:	3. <input type="checkbox"/> Governmental Agency	4. <input type="checkbox"/> Partnership Agency
Contact Person:			5. <input checked="" type="checkbox"/> Other: <u>Municipality</u>	
		Telephone Number:		

**D. Owner of the Land:**

Name: Same as Owner			Owner Type (Check One)	
Address:			1. <input type="checkbox"/> Individual	2. <input type="checkbox"/> Corporation
City:	State:	Zip Code:	3. <input type="checkbox"/> Governmental Agency	4. <input type="checkbox"/> Partnership Agency
Contact Person:			5. <input checked="" type="checkbox"/> Other: <u>Municipality</u>	
		Telephone Number:		

**E. Address Where Legal Notice May Be Served:**

Address: 14440 Twin Cities Road			
City: Herald	State: CA	Zip Code: 95638	
Contact Person: Steven Redeker		Telephone Number: (916) 732-4827	

**F. Billing Address:**

Address: 14440 Twin Cities Road			
City: Herald	State: CA	Zip Code: 95638	
Contact Person: Steven Redeker		Telephone Number: (916) 732-4827	

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY



State of California  
Regional Water Quality Control Board

**APPLICATION/REPORT OF WASTE DISCHARGE  
GENERAL INFORMATION FORM FOR  
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT**



**II. TYPE OF DISCHARGE**

Check Type of Discharge(s) Described in this Application (A or B):

- A. WASTE DISCHARGE TO LAND       B. WASTE DISCHARGE TO SURFACE WATER

Check all that apply:

- |  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/> Domestic/Municipal Wastewater Treatment and Disposal | <input type="checkbox"/> Animal Waste Solids           | <input type="checkbox"/> Animal or Aquacultural Wastewater  |
| <input type="checkbox"/> Cooling Water   | <input type="checkbox"/> Land Treatment Unit           | <input type="checkbox"/> Biosolids/Residual                 |
| <input type="checkbox"/> Mining  | <input type="checkbox"/> Dredge Material Disposal      | <input type="checkbox"/> Hazardous Waste (see instructions) |
| <input type="checkbox"/> Waste Pile  | <input type="checkbox"/> Surface Impoundment           | <input type="checkbox"/> Landfill (see instructions)        |
| <input type="checkbox"/> Wastewater Reclamation  | <input type="checkbox"/> Industrial Process Wastewater | <input checked="" type="checkbox"/> Storm Water             |
| <input type="checkbox"/> Other, please describe: _____                                   |  |   |

**III. LOCATION OF THE FACILITY**

Describe the physical location of the facility.

1. Assessor's Parcel Number(s)  
Facility: 140-05-08, 140-06-12\*  
Discharge Point: 140-05-10

2. Latitude  
Facility: 38° 20'44" 38° 19'47"\*\*\*  
Discharge Point: 38° 20'35"

3. Longitude  
Facility: 121° 7'16", 121° 5'52"\*\*\*  
Discharge Point: 121° 7'34"

\*Rancho Seco Park

**IV. REASON FOR FILING**

- |   |  |
|---|--|
| <input type="checkbox"/> New Discharge or Facility            | <input type="checkbox"/> Changes in Ownership/Operator (see instructions)                          |
| <input type="checkbox"/> Change in Design or Operation        | <input checked="" type="checkbox"/> Waste Discharge Requirements Update or NPDES Permit Reissuance |
| <input type="checkbox"/> Change in Quantity/Type of Discharge | <input type="checkbox"/> Other: _____  |

**V. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)**

Name of Lead Agency: N/A

Has a public agency determined that the proposed project is exempt from CEQA?     Yes     No

If Yes, state the basis for the exemption and the name of the agency supplying the exemption on the line below.

Basis for Exemption/Agency: \_\_\_\_\_

Has a "Notice of Determination" been filed under CEQA?     Yes     No

If Yes, enclose a copy of the CEQA document, Environmental Impact Report, or Negative Declaration. If no, identify the expected type of CEQA document and expected date of completion.

Expected CEQA Documents:

- EIR     Negative Declaration

Expected CEQA Completion Date: N/A

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY



State of California  
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE  
GENERAL INFORMATION FORM FOR  
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT



VI. OTHER REQUIRED INFORMATION

Please provide a COMPLETE characterization of your discharge. A complete characterization includes, but is not limited to, design and actual flows, a list of constituents and the discharge concentration of each constituent, a list of other appropriate waste discharge characteristics, a description and schematic drawing of all treatment processes, a description of any Best Management Practices (BMPs) used, and a description of disposal methods.

Also include a site map showing the location of the facility and, if you are submitting this application for an NPDES permit, identify the surface water to which you propose to discharge. Please try to limit your maps to a scale of 1:24,000 (7.5' USGS Quadrangle) or a street map, if more appropriate.

VII. OTHER

Attach additional sheets to explain any responses which need clarification. List attachments with titles and dates below:

A complete characterization is included in the attached completed EPA forms (Form 1 and Form 2C), which include a USGS map

You will be notified by a representative of the RWQCB within 30 days of receipt of your application. The notice will state if your application is complete or if there is additional information you must submit to complete your Application/Report of Waste Discharge, pursuant to Division 7, Section 13260 of the California Water Code.

VIII. CERTIFICATION

"I certify under penalty of law that this document, including all attachments and supplemental information, were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name: Steven Redeker

Title: Manager, Plant Closure & Decommission

Signature: *Steven Redeker for SSA*

Date: 11/30/05

FOR OFFICE USE ONLY

Date Form 200 Received:	Letter to Discharger:	Fee Amount Received:	Check #:
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(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. GPO 1979. 2040-0000.

FORM <b>1</b> GENERAL	<b>EPA</b>	U.S. ENVIRONMENTAL PROTECTION AGENCY <b>GENERAL INFORMATION</b> Consolidated Permits Program (Read the "General Instructions" before starting.)	I. EPA I.D. NUMBER	
			CA 0004758	D

L. EPA I.D. NUMBER		<b>PLEASE PLACE LABEL IN THIS SPACE</b>
M. FACILITY NAME		
N. FACILITY MAILING ADDRESS		
O. FACILITY LOCATION		
P. FACILITY LOCATION		

**GENERAL INSTRUCTIONS**

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items L, M, N, and O (except O-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

**II. POLLUTANT CHARACTERISTICS**

**INSTRUCTIONS:** Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X'			SPECIFIC QUESTIONS	MARK 'X'		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X		X	D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

**III. NAME OF FACILITY**

1 SKIP SMUD RANCHO SECO AND RANCHO SECO PARK

**IV. FACILITY CONTACT**

A. NAME & TITLE (last, first, & title)  
2 GACKE BRAD CHEMISTRY SPECIALIST

B. PHONE (area code & no.)  
916 7 32 4812

**V. FACILITY MAILING ADDRESS**

A. STREET OR P.O. BOX  
3 14440 TWIN CITIES ROAD

B. CITY OR TOWN  
4 HERALD

C. STATE  
CA

D. ZIP CODE  
95638

**VI. FACILITY LOCATION**

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER  
5 14440 TWIN CITIES ROAD

B. COUNTY NAME  
SACRAMENTO

C. CITY OR TOWN  
6 HERALD

D. STATE  
CA

E. ZIP CODE  
95638

F. COUNTY CODE (if different)

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST				B. SECOND			
7	9999	(specify)	non-classifiable	7		(specify)	
C. THIRD				D. FOURTH			
7		(specify)		7		(specify)	

VIII. OPERATOR INFORMATION

A. NAME										B. Is the name listed in Item VIII-A also the owner?	
SACRAMENTO MUNICIPAL UTILITY DISTRICT										<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box: if "Other", specify.)										D. PHONE (area code & no.)	
F = FEDERAL S = STATE P = PRIVATE M = PUBLIC (other than federal or state) O = OTHER (specify)										M MUNICIPAL	
E. STREET OR P.O. BOX										916 732 4827	
6201 S STREET											
F. CITY OR TOWN					G. STATE		H. ZIP CODE		IX. INDIAN LAND		
SACRAMENTO					CA		95817		Is the facility located on Indian lands? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)				D. PSD (Air Emissions from Proposed Sources)			
9	N	CA	0004758	9	P		
B. UIC (Underground Injection of Fluids)				E. OTHER (specify)			
9	U			9		DPR-54	US NRC LICENSE
C. RCRA (Hazardous Wastes)				E. OTHER (specify)			
9	R	CA	D000626010	9		SNM-2510	US NRC ISFSI LICENSE

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Rancho Seco is a decommissioning nuclear facility nearing completion of the dismantlement phase of decommissioning. Future activities are to complete dismantlement of the reactor components, radioactive water processing equipment and structure, and perform the final site radiation survey. The discharge is comprised of dilution water, fire protection water, storm water runoff, treated domestic sewage, and batch releases of processed radioactive and potentially radioactive water. The processing of radioactive water includes reverse osmosis, demineralization, filtration, distillation, sedimentation, cyclone separation, dilution, and/or blending. Processing and discharge of radioactive water is regulated by and reported to the U.S. Nuclear Regulatory Commission (NRC).

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Steven Redeker, Manager PC&D	<i>Steven Redeker</i>	11/30/05

COMMENTS FOR OFFICIAL USE ONLY

C	
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Please print or type in the unshaded areas only.



U.S. ENVIRONMENTAL PROTECTION AGENCY  
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER  
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS  
Consolidated Permits Program

**I. OUTFALL LOCATION**

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (list)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (name)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
001	38	20	35	121	07	34	Tributary to Hadselville Creek
002	38	20	35	121	07	33	Tributary to Hadselville Creek

**II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES**

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. (list)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
	a. OPERATION (list)	b. AVERAGE FLOW (include units)	c. DESCRIPTION	d. LIST CODES FROM TABLE 2C-1
001	Dilution Water	9640 gpm	From Folsom South Canal*	4-A
	Fire Pump Discharge	2000 gpm	Fire Pump Discharge	1-0
	Processed Radioactive water	500gpm	Batch Release of Retention Basin**	1-0 4-A
001	Storm Water Runoff	13 gpm	Storm Water Runoff	4-A
	Domestic Sewage	1 gpm	Extended Aeration, Overland Terrace	3-A 3-B 2-F
002	Storm Water Runoff	66 gpm	Storm Water Runoff	4-A
*A continuous dilution water flow is maintained to meet the requirements of the U.S. NRC.				
** Processed radioactive water may receive one or more of the following treatments depending on the characteristic of the waste, e.g. solids content, radionuclide concentration: 1-D, 1-F, 1-Q, 1-S, 1-U, 2-A, 2-E, 2-F, 2-J, 2-K				

OFFICIAL USE ONLY (effluent guidelines sub-categories)

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?  
 YES (complete the following table)  NO (go to Section III)

1. OUTFALL NUMBER (list)	2. OPERATION(s) CONTRIBUTING FLOW (list)	3. FREQUENCY		4. FLOW				5. DURATION (in days)
		a. DAYS PER WEEK (specify average)	b. MONTHS PER YEAR (specify average)	a. FLOW RATE (in mgd)		b. TOTAL VOLUME (specify with units)		
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	
001	Processed Radioactive water	<1	12	0.93	1.33	324094 gallon	407250 gallon	10
001	Sewage treatment/overland terrace (zero discharge during warm weather)	7	8	0.0038	0.042	2785 gallon	14014 gallon	240
001	Fire protection pump	1	12	0.06	1.2	60000 gallon	1200000 gallon	65

**III. PRODUCTION**

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?  
 YES (complete Item III-B)  NO (to Section IV)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (or other measure of operation)?  
 YES (complete Item III-C)  NO (go to Section IV)

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS (list outfall numbers)
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. (specify)	

**IV. IMPROVEMENTS**

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.  
 YES (complete the following table)  NO (go to Item IV.B)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. NO.	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs for other environmental projects which may affect your discharges you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedule for construction.  MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER (copy from Item 1 of Form 1)  
CA 0004758

V. INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)

OUTFALL NO.  
001

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT						4. NO. OF ANALYSES	3. UNITS (specify if blank)		4. INTAKE (optional)		
	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)			5. CONCENTRATION	6. MASS	3. LONG TERM AVERAGE VALUE		4. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Biochemical Oxygen Demand (BOD)	1.3	140	1.15	109	1.15	133	2	mg/L	lbs	N/A	N/A	N/A
b. Chemical Oxygen Demand (COD)	16	1581	13	1238	13	1509	2	mg/L	lbs	N/A	N/A	N/A
c. Total Organic Carbon (TOC)	2.7	290	2.6	248	2.6	302	2	mg/L	lbs	N/A	N/A	N/A
d. Total Suspended Solids (TSS)	44	6543	9.4	1319	1.9	221	53	mg/L	lbs	N/A	N/A	N/A
e. Ammonia (as N)	<0.50	<54	<0.50	<48	<0.50	<58	2	mg/L	lbs	N/A	N/A	N/A
f. Flow	VALUE 23.02		VALUE 20.47		VALUE 13.91		365	MGD	N/A	VALUE N/A		N/A
g. Temperature (winter)	VALUE 18		VALUE 16		VALUE 13		46	°C		VALUE N/A		N/A
h. Temperature (summer)	VALUE 29		VALUE 27		VALUE 23		64	°C		VALUE N/A		N/A
i. pH	MINIMUM 6.71	MAXIMUM 8.34	MINIMUM 7.04	MAXIMUM 7.89	X		69	STANDARD UNITS		X		

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'		3. EFFLUENT						4. NO. OF ANALYSES	4. UNITS		5. INTAKE (optional)		
	a. PRESENT	b. ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)			5. CONCENTRATION	6. MASS	3. LONG TERM AVERAGE VALUE		4. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Bromide (24958-67-9)		X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
b. Chlorine, Total Residual	X		0.018	2.66	0.0037	0.58	0.0011	0.13	131	mg/L	lbs	N/A	N/A	N/A
c. Color		X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
d. Fecal Coliform	X		8	N/A	5	N/A	5	N/A	2	MPN/100ml	N/A	N/A	N/A	N/A
e. Fluoride (18984-48-8)		X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
f. Nitrate-Nitrite (as N)	X		<0.05	<5.4	<0.05	<4.8	<0.05	<5.8	2	mg/L	lbs	N/A	N/A	N/A

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'		3. EFFLUENT						4. UNITS		5. INTAKE (optional)				
	a. BE- LIEVED PRE- KEY	b. BE- LIEVED AS- KEY	b. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)		d. NO. OF ANAL- YSES	e. CONCENTRATION	f. MASS	g. LONG TERM AVERAGE VALUE		h. NO. OF ANAL- YSES	
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS		
g. Nitrogen, Total Organic (as N)		X													
h. Oil and Grease		X													
i. Phosphorus (as P), Total (7723-14-0)		X													
j. Radioactivity															
(1) Alpha, Total			Cover Letter refers to a more detailed characterization of radioactivity.												
(2) Beta, Total			Cover Letter refers to a more detailed characterization of radioactivity.												
(3) Radium, Total			Cover Letter refers to a more detailed characterization of radioactivity.												
(4) Radium 226, Total			Cover Letter refers to a more detailed characterization of radioactivity.												
k. Sulfate (as SO <sub>4</sub> ) (14808-79-8)		X													
l. Sulfide (as S)		X													
m. Sulfite (as SO <sub>3</sub> ) (14265-45-3)		X													
n. Surfactants		X													
o. Aluminum, Total (7429-90-5)		X													
p. Barium, Total (7440-39-3)		X													
q. Boron, Total (7440-42-8)	X		<0.1	<19.2	<0.1	<17.1	<0.1	<11.6	12	mg/L	lbs	N/A	N/A	N/A	
r. Cobalt, Total (7440-48-4)		X													
s. Iron, Total (7439-89-6)		X													
t. Magnesium, Total (7439-95-4)		X													
u. Molybdenum, Total (7439-98-7)		X													
v. Manganese, Total (7439-96-5)		X													
w. Tin, Total (7440-31-5)		X													
x. Titanium, Total (7440-32-6)		X													

CONTINUED FROM PAGE 3 OF FORM 2-C

**PART C -** If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (all 7 pages) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	a. TEST RE-QUIR-ED	b. SEC-ON-DRY	c. SE-COND-ARY	8. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)		d. NO. OF ANAL- YSES	8. CONCENTRATION	b. MASS	b. LONG TERM AVERAGE VALUE		b. NO. OF ANAL- YSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
<b>METALS, CYANIDE, AND TOTAL PHENOLS</b>															
1M. Antimony, Total (7440-36-0)			X												
2M. Arsenic, Total (7440-38-2)			X												
3M. Beryllium, Total (7440-41-7)			X												
4M. Cadmium, Total (7440-43-9)			X												
5M. Chromium, Total (7440-47-3)			X												
6M. Copper, Total (7440-50-8)		X		4.8	0.41	4.8	0.44	1.2	0.14	4	ppb	lbs	N/A	N/A	N/A
7M. Lead, Total (7439-92-1)			X												
8M. Mercury, Total (7439-97-6)		X		0.0005	0.00005	0.0005	0.00007	0.00025	0.00003	4	ppb	lbs	N/A	N/A	N/A
9M. Nickel, Total (7440-02-0)			X												
10M. Selenium, Total (7782-49-2)			X												
11M. Silver, Total (7440-22-4)			X												
12M. Thallium, Total (7440-28-0)			X												
13M. Zinc, Total (7440-66-6)		X		5	0.45	5	0.70	2.9	0.34	4	ppb	lbs	N/A	N/A	N/A
14M. Cyanide, Total (57-12-5)			X												
15M. Phenole, Total			X												
<b>DIOXIN</b>															
2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	A. TESTING REQUIRED	B. RECEIVED PRESENT	C. RECEIVED ADJ. PRESENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)		d. NO. OF ANALYSES	e. CONCENTRATION	f. MASS	g. LONG TERM AVERAGE VALUE		h. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)			X												
2V. Acrylonitrile (107-13-1)			X												
3V. Benzene (71-43-2)			X												
4V. Bis (Chloromethyl) Ether (542-88-1)			X												
5V. Bromoform (75-25-2)			X												
6V. Carbon Tetrachloride (56-23-5)			X												
7V. Chlorobenzene (108-90-7)			X												
8V. Chlorodibromomethane (124-46-1)			X												
9V. Chloroethane (75-00-3)			X												
10V. 2-Chloroethylvinyl Ether (110-75-8)			X												
11V. Chloroform (67-66-3)			X												
12V. Dichlorobromomethane (75-27-4)			X												
13V. Dichlorodifluoromethane (75-71-8)			X												
14V. 1,1-Dichloroethane (75-34-3)			X												
15V. 1,2-Dichloroethane (107-06-2)			X												
16V. 1,1-Dichloroethylene (75-35-4)			X												
17V. 1,2-Dichloropropane (78-87-5)			X												
18V. 1,3-Dichloropropane (542-75-6)			X												
19V. Ethylbenzene (100-41-4)			X												
20V. Methyl Bromide (74-83-9)			X												
21V. Methyl Chloride (74-87-3)			X												

1. POLLUTANT AND CAS NUMBER (If available)	2. MARK 'X'			3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	A. TESTING COMPLETED	B. BE-RIEVED	C. BE-RIEVED	B. MAXIMUM DAILY VALUE		D. MAXIMUM 30 DAY VALUE (If available)		G. LONG TERM AVG. VALUE (If available)		D. NO. OF ANALYSES	B. CONCENTRATION	b. MASS	E. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
<b>GC/MS FRACTION - VOLATILE COMPOUNDS (continued)</b>															
22V. Methylene Chloride (75-09-2)			X												
23V. 1,1,2,2-Tetrachloroethane (79-34-6)			X												
24V. Tetrachloroethylenes (127-18-4)			X												
25V. Toluene (108-88-3)			X												
26V. 1,2-Trans-Dichloroethylenes (156-60-5)			X												
27V. 1,1,1-Trichloroethane (71-55-6)			X												
28V. 1,1,2-Trichloroethane (79-00-5)			X												
29V. Trichloroethylenes (79-01-6)			X												
30V. Trichlorofluoromethane (75-69-4)			X												
31V. Vinyl Chloride (75-01-4)			X												
<b>GC/MS FRACTION - ACID COMPOUNDS</b>															
1A. 2-Chlorophenol (95-57-8)			X												
2A. 2,4-Dichlorophenol (120-83-2)			X												
3A. 2,4-Dimethylphenol (106-67-9)			X												
4A. 4,6-Dinitro-O-Cresol (534-52-1)			X												
5A. 2,4-Dinitrophenol (51-28-5)			X												
6A. 2-Nitrophenol (88-75-5)			X												
7A. 4-Nitrophenol (100-02-7)			X												
8A. P-Chloro-M-Cresol (59-50-7)			X												
9A. Pentachlorophenol (87-86-5)			X												
10A. Phenol (108-95-2)			X												
11A. 2,4,6-Trichlorophenol (88-04-2)			X												

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	A. YEAR ING. REG. G.U.I.R. ED	B. SE- LIEVED PRE- SENT	C. SE- LIEVED RE- SENT	B. MAXIMUM DAILY VALUE		D. MAXIMUM 30 DAY VALUE (if available)		E. LONG TERM AVG. VALUE (if available)		G. NO. OF ANAL- YSES	F. CONCENTRATION	H. MASS	I. LONG TERM AVERAGE VALUE		J. NO. OF ANAL- YSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
18. Acenaphthene (83-32-9)			X												
28. Acenaphthylene (208-96-8)			X												
38. Anthracene (120-12-7)			X												
48. Benzidine (92-87-5)			X												
58. Benzo (a) Anthracene (56-55-3)			X												
68. Benzo (a) Pyrene (50-32-8)			X												
78. 3,4-Benzofluoranthene (205-99-2)			X												
88. Benzo (ghi) Perylene (181-24-2)			X												
98. Benzo (k) Fluoranthene (207-06-9)			X												
108. Bis (2-Chloroethoxy) Methane (111-91-1)			X												
118. Bis (2-Chloroethyl) Ether (111-44-4)			X												
128. Bis (2-Chloroisopropyl) Ether (102-80-1)			X												
138. Bis (2-Ethylhexyl) Phthalate (117-81-7)			X												
148. 4-Bromodiphenyl Phenyl Ether (101-55-3)			X												
168. Butyl Benzyl Phthalate (80-08-7)			X												
188. 2-Chloronaphthalene (91-58-7)			X												
178. 4-Chlorodiphenyl Phenyl Ether (7006-72-3)			X												
188. Chrysene (218-01-9)			X												
198. Dibenzo (a,h) Anthracene (53-70-3)			X												
208. 1,2-Dichlorobenzene (95-50-1)			X												
218. 1,3-Dichlorobenzene (541-73-1)			X												

CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	a. TESTING REQUIRED	b. RECOVERED	c. RELEVANT	b. MAXIMUM DAILY VALUE		d. MAXIMUM 30 DAY VALUE (if available)		e. LONG TERM AVRG. VALUE (if available)		f. NO. OF ANALYSES	g. CONCENTRATION	h. MASS	b. LONG TERM AVERAGE VALUE		d. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
<b>GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)</b>															
22B: 1,4-Dichlorobenzene (106-46-7)			X												
23B: 3,3'-Dichlorobenzidine (91-04-1)			X												
24B: Diethyl Phthalate (84-66-2)			X												
25B: Dimethyl Phthalate (131-11-3)			X												
26B: Di-N-Butyl Phthalate (84-74-2)			X												
27B: 2,4-Dinitrotoluene (121-14-2)			X												
28B: 2,6-Dinitrotoluene (806-20-2)			X												
29B: Di-N-Octyl Phthalate (117-84-0)			X												
30B: 1,2-Diphenylhydrazine (or Azobenzene) (122-66-7)			X												
31B: Fluoranthene (206-44-0)			X												
32B: Fluorene (86-73-7)			X												
33B: Hexachlorobenzene (118-74-1)			X												
34B: Hexachlorobutadiene (87-69-3)			X												
35B: Hexachlorocyclopentadiene (77-47-4)			X												
36B: Hexachloroethane (67-72-1)			X												
37B: Indeno (1,2,3-cd) Pyrene (193-39-5)			X												
38B: Isophorone (78-59-1)			X												
39B: Naphthalene (81-20-3)			X												
40B: Nitrobenzene (98-96-3)			X												
41B: N-Nitrosodimethylamine (62-76-9)			X												
42B: N-Nitrosodi-N-Propylamine (621-64-7)			X												

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	A. TEST NO. RE-QUIR-ED	B. SE-RI-AL NO. PRE-SENT	C. RE-CEIVED AS-SENT	B. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)		d. NO. OF ANAL- YSES	A. CONCENTRATION	D. MASS	B. LONG TERM AVERAGE VALUE		D. NO. OF ANAL- YSES
				(1) CONCENTRATION	(1) MASS	(1) CONCENTRATION	(1) MASS	(1) CONCENTRATION	(1) MASS				(1) CONCENTRATION	(1) MASS	
<b>GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)</b>															
43B. N-Nitrosodiphenylamine (86-30-6)			X												
44B. Phenanthrene (85-01-8)			X												
45B. Pyrene (129-00-0)			X												
46B. 1,2,4-Trichlorobenzene (120-82-1)			X												
<b>GC/MS FRACTION - PESTICIDES</b>															
1P. Aldrin (309-00-2)			X												
2P. $\alpha$ -BHC (319-84-6)			X												
3P. $\beta$ -BHC (319-85-7)			X												
4P. $\gamma$ -BHC (68-89-9)			X												
5P. $\delta$ -BHC (319-86-8)			X												
6P. Chlordane (67-74-9)			X												
7P. 4,4'-DDT (80-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-67-1)			X												
11P. $\alpha$ -Endosulfan (115-29-7)			X												
12P. $\beta$ -Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	A. YES IND. IN QUIN- ED	B. NO. DISE- SENT	C. NO. COL- LEGE- SENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANAL- YSES	e. CONCEN- TRATION	f. MASS	g. LONG TERM AVERAGE VALUE		h. NO. OF ANAL- YSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
<b>GC/MS FRACTION - PESTICIDES (continued)</b>															
17P. Heptachlor Epoxide (1024-67-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11098-82-6)			X												
24P. PCB-1018 (12674-11-2)			X												
25P. Toxaphene (8001-36-2)			X												

CONTINUED FROM PAGE 2

**V. INTAKE AND EFFLUENT CHARACTERISTICS**

A, B, & C: See instructions before proceeding - Complete one set of tables for each outfall - Annotate the outfall number in the space provided.  
 NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
Asbestos	Residual from asbestos abatement projects. Combined Effluent sample results: Non-Detectable (<0.2 million fibers/L)		

**VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS**

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

YES (list all such pollutants below)  NO (go to Item VI-B)

Empty space for listing pollutants.

**VII. BIOLOGICAL TOXICITY TESTING DATA**

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

YES (Identify the test(s) and describe their purposes below)

NO (go to Section VIII)

96 hr Acute Static Screening Bioassay with Fathead Minnows.

- Chronic Toxicity Testing
- 1) Fathead Minnow larval survival and growth test
  - 2) Ceriodaphnia dubia survival and reproduction test
  - 3) Algal, Selenastrum capricornutum, growth test

Acute and Chronic Toxicity tests were conducted to comply with current NPDES permit.

**VIII. CONTRACT ANALYSIS INFORMATION**

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

YES (list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)

NO (go to Section IX)

A. NAME	B. ADDRESS	C. TELEPHONE (area code & no.)	D. POLLUTANTS ANALYZED (list)
Sierra Foothill Laboratory	255 Scottsville Blvd PO Box 1268 Jackson, CA 95642	(209) 223-2800	Toxicity tests, BOD, COD, TOC, Ammonia, Nitrate, Coliform, Boron, metals, dioxins, pesticide volatile organics, semi-volatile organics, asbestos.

**IX. CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE (type or print)

Steven Redeker, Manager PC&D

B. PHONE NO. (area code & no.)

(916) 732-4827

C. SIGNATURE

*Steven Redeker for SJR*

D. DATE SIGNED

11/30/05

RSNGS ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
JANUARY - DECEMBER 2004

**INTRODUCTION**

Rancho Seco Nuclear Generating Station (RSNGS) Unit No. 1 is located in Sacramento County, California approximately 25 miles southeast of Sacramento and 26 miles north-northeast of Stockton. Rancho Seco Unit No. 1 began commercial operation on April 17, 1975. The single unit on the Rancho Seco site was a pressurized water reactor supplied by Babcock and Wilcox. The rated capacity was 963 gross megawatts electrical. Because of a public vote on June 6, 1989, the District shutdown the Rancho Seco Nuclear Generating Station and completed defueling operations on December 8, 1989. Transfer of the spent fuel rod assemblies from the Spent Fuel Pool into dry storage at the Interim Spent Fuel Storage Installation (ISFSI) was completed on August 21, 2002.

This Annual Radioactive Effluent Release Report (ARERR) provides a summary of gaseous and liquid effluent releases made from Rancho Seco during the period of January 1 through December 31, 2004. Also presented in this report is the projected radiological impact from these releases and a summary of solid radioactive waste shipments.

This report has been prepared by the Sacramento Municipal Utility District to meet the requirements of Rancho Seco Quality Manual (RSQM), Appendix A, Section 1.5.3 and Offsite Dose Calculation Manual (ODCM) Revision 17, Step 6.13. It is presented in accordance with the format of USNRC Regulatory Guide 1.21. The radiation doses reported in this ARERR are calculated for a hypothetical individual who receives the maximum possible exposure at or beyond the applicable Site Boundary.

Releases of radioactivity in gaseous and liquid effluents during this report period did not exceed the limits of 10 CFR 20 or the numerical guidelines of 10 CFR 50, Appendix I. A 40 CFR 190 dose evaluation is not required because radioactive effluent releases did not exceed twice the numerical guidelines of 10 CFR 50, Appendix I.

This report also summarizes gaseous and liquid effluent releases made from the Rancho Seco ISFSI during the period of January 1 through December 31, 2004, and concludes there were no radionuclides released into the environment due to ISFSI operations. The ISFSI radioactive effluent report has been prepared to meet the requirements of 10 CFR 72.44(d) and Rancho Seco ISFSI Technical Specification 5.5.2.d.

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**I. SUPPLEMENTAL INFORMATION**

**A. REGULATORY LIMITS & GUIDELINES FOR EFFLUENT RELEASES**

**1. Gaseous Effluents**

- a. Dose rate limit at or beyond the Site Boundary for Gaseous Effluents for Tritium and radioactive material in particulate form with half-lives greater than 8 days (ODCM, Technical Requirement 6.12.6):

1500 mrem/year to any organ

- b. Dose commitment to a member of the public at or beyond the Site Boundary for Gaseous Effluents from Tritium and radioactive material in particulate form with half-lives greater than 8 days (ODCM Technical Requirement 6.12.7, numerical guidelines of 10 CFR 50, Appendix I):

7.5 mrem per calendar quarter to any organ

15 mrem per calendar year to any organ

**2. Liquid Effluents**

- a. The concentration of radioactive material in liquid effluents released beyond the Site Boundary for Liquid Effluents shall not exceed the limits of 10 CFR 20, Appendix B, Table 2, Column 2. This applies to all radionuclides except dissolved or entrained noble gases (ODCM Technical Requirement 6.12.2).

- b. Dose commitment to a member of the public at or beyond the Site Boundary for Liquid Effluents from radioactive materials in liquid effluents shall be limited to (ODCM Technical Requirement 6.12.3, numerical guidelines of 10 CFR 50, Appendix I):

1.5 mrem per calendar quarter to the total body

5 mrem per calendar quarter to any organ

3 mrem per calendar year to the total body

10 mrem per calendar year to any organ

**NOTE:** The noble gas source term was removed when spent fuel transfer to the ISFSI was completed in August 2002. Reference to noble gases was completely removed from the ODCM.

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**B. MAXIMUM EFFLUENT CONCENTRATIONS**

**1. Gaseous Effluents**

The concentrations listed in 10 CFR 20, Appendix B, Table 2, Column 1 (air) are not directly used in calculations for determining permissible gaseous effluent release rates. The annual dose limits of 10 CFR 20 for unrestricted areas are the doses associated with the concentrations of 10 CFR 20, Appendix B, Table 2, Column 1. ODCM Technical Requirement dose rate limits (mrem/yr) for gaseous effluents are provided to ensure that the dose rate from gaseous effluents at any time at the Site Boundary for Gaseous Effluents will be within the annual dose limits of 10 CFR 20 for unrestricted areas. These dose rate limits (listed above in part A) are used for determining permissible gaseous effluent release rates.

**2. Liquid Effluents**

The concentration values listed in 10 CFR 20, Appendix B, Table 2, Column 2 are used in calculations to determine permissible liquid discharge flow rates. The most conservative Maximum Effluent Concentration (MEC) value for each radionuclide detected in the liquid effluent sample (excluding dissolved or entrained noble gases) is used in the calculations.

**C. MEASUREMENT METHODS FOR TOTAL RADIOACTIVITY**

**1. Gaseous Effluents**

Liquid Scintillation (H-3)

Gamma Spectroscopy (HPGe)

Beta Proportional (Sr-90, gross beta)

Alpha Proportional (gross alpha)

**2. Liquid Effluents**

Gamma Spectroscopy (HPGe)

Liquid Scintillation (H-3)

Beta Proportional (Sr-90, gross beta)

Alpha Proportional (gross alpha)

**NOTE:** HPGe refers to Hyper-Pure Germanium

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D. BATCH RELEASES (via monitored pathways)

1. Liquid (Retention Basin Discharges)	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
a. Number of batch releases	0	1	1	1
b. Total time period for batch releases (hours)	N/A	9.00	8.58	13.33
c. Maximum time period for a batch release (hours)	N/A	9.00	8.58	13.33
d. Average time period for a batch release (hours)	N/A	9.00	8.58	13.33
e. Minimum time period for a batch release (hours)	N/A	9.00	8.58	13.33

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**E. UNPLANNED RELEASES**

This section describes unplanned releases of radioactivity in liquid and gaseous effluent.

Gaseous

None

Liquid

Due to a heavy rain storm on September 19, 2004, the plant experienced a loss of off-site power that led to a series of events causing multiple equipment failures. The multiple equipment failures resulted in all water entering the site from Folsom South Canal or Rancho Seco Lake to be diverted into the Retention Basins. Subsequently, the South Retention Basin overflowed. Based on the plant flow recorder, the overflow started at 1915 (7:15 PM) and stopped at 2115 (9:15 PM). The volume of water released was approximately 270,000 gallons.

A sample of the South Retention Basin while overflowing was taken on September 19, 2004 at 2030 (8:30 PM). The sample was analyzed for gamma emitters and results showed no detectable radionuclides, except for naturally occurring radioisotopes. Since this sample was taken during the overflow condition and not just prior to the discharge, the sample may not be representative of the radioactivity discharged off site.

To conservatively estimate the maximum activity that may have been discharged off site as a result of the overflow condition, plant staff used the analysis results of a Retention Basin sample taken prior to the overflow condition and applied these results to the entire estimated volume discharged during the overflow condition. Based on this pre-overflow condition sample, the calculated maximum concentration discharged for Tritium was  $2.44 \text{ E-}06 \text{ } \mu\text{Ci/ml}$ , for Cobalt 60 was  $1.58 \text{ E-}08 \text{ } \mu\text{Ci/ml}$ , and for Cesium 137 was  $1.10 \text{ E-}08 \text{ } \mu\text{Ci/ml}$ . The maximum organ dose associated with these concentrations was  $9.76 \text{ E-}06 \text{ mrem}$  to a Child/Bone. The highest Total Body dose was  $4.84 \text{ E-}03 \text{ mrem}$  to an Adult.

The plant corrective action program was used to resolve and implement the actions necessary to prevent recurrence. Documentation for this incident can be found in the plant commitment tracking system under CTS item number 53590 or PDQ 04-0025.

**F. RADIOACTIVE EFFLUENT MONITORING INSTRUMENTATION INOPERABLE FOR GREATER THAN 30 DAYS**

R15017A, Retention Basin Effluent Discharge Monitor, was inoperable for greater than 30 days. On July 20, 2004, R15017A failed to return to service after restoration of site power. A broken electronic component was determined to be the cause of the failure. The electronic component was replaced and the monitor was successfully fixed.

In order to restore the monitor back to operability, plant staff had to perform a source calibration check on the R15017A detector. However, it was discovered that the calibration source, was prematurely disposed of earlier in the year during a campaign to remove radioactive sources no longer needed on site.

The original vendor for the detector was contacted and it was determined that a new source and calibration of the detector would be required to restore the monitor back to operability. Due to the specific requirements for the source, the new source could not be manufactured and used

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for calibration until February 2005. The detector was shipped to the vendor for the calibration in February and returned to the plant on March 3, 2005.

Although the monitor could not be calibrated during its period of inoperability, the monitor was capable of performing its function. After successfully passing its operability test, R15017A was returned to service on March 10, 2005.

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**IV. LIQUID EFFLUENTS**

Table IV-A, Liquid Effluents - Summation of All Releases, provides a detailed summary of liquid effluent releases per quarter. This table summarizes releases of fission and activation products, tritium, dissolved and entrained gases, and gross alpha radioactivity. Also listed is the volume of waste released prior to dilution and the volume of dilution water used during each quarter.

The following methodology is used to calculate the Average Diluted Concentration and the Percent of ODCM Technical Requirement Limit in Table IV-A:

$$\% \text{ Tech Req Limit} = \sum_i^n \left[ \frac{C_i}{\text{MEC}_i} \right]$$

where: n = The total number of radionuclides identified  
C<sub>i</sub> = The average diluted concentration of radionuclide i

$$= \frac{(\text{Total Release per Category per Quarter in } \mu\text{Ci})}{(\text{Total Release Volume (part F in Table IV - A) in ml)}$$

MEC<sub>i</sub> = The MEC of the i<sup>th</sup> radionuclide, from 10 CFR 20, Appendix B, Table 2, Column 2

The methodology used to calculate the estimated total error in Table IV-A is presented in Section II of this report.

Table IV-B, Liquid Effluents, provides a complete quarterly summary of the amount of radioactivity (Ci) released per radionuclide in each quarter. Data is provided for fission and activation products, and for dissolved and entrained gases. Tritium and gross alpha are not included in this table (they are listed in Table IV-A). Since no continuous releases of liquid radioactive effluent are made from RSNGS, data is provided only for batch releases.

Table IV-C, Liquid Effluents - Typical Lower Limits of Detection, provides a listing of the typical lower limit of detection (LLD) concentrations in  $\mu\text{Ci/ml}$  for various radionuclides.

Table IV-D, Radiological Impact on Man Due To Liquid Effluent Releases, provides a summary of calculated radiation doses delivered to a maximum exposed hypothetical individual at the Site Boundary for Liquid Effluents (actual doses will be assessed in the 2004 Annual REMP Report). The maximum calculated total body dose and organ dose are listed for each quarter along with an annual total. A comparison versus ODCM Technical Requirement dose limits is also presented.

RSNGS ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
JANUARY - DECEMBER 2004

TABLE IV-A

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>	<u>Est. Total Error, %</u>
<b>A. Fission &amp; Activation Products</b>						
1. Total Release (not including tritium, gases, alpha)	Ci	0.00 E+00	1.70 E-05	1.12 E-05	1.13 E-05	2.3 E+01
2. Average diluted concentration during period	µCi/ml	0.00 E+00	4.74 E-12	2.97 E-12	2.43 E-12	
3. Percent of Tech Reg limit	%	N/A	3.18 E-04	1.73 E-04	1.61 E-04	
<b>B. Tritium</b>						
1. Total Release	Ci	0.00 E+00	6.70 E-03	0.00 E+00	2.05 E-03	2.3 E+01
2. Average diluted concentration during period	µCi/ml	0.00 E+00	1.86 E-09	0.00 E+00	4.42 E-10	
3. Percent of Tech Reg limit	%	N/A	1.86 E-04	N/A	4.42 E-05	
<b>C. Dissolved and Entrained Gases (i.e., Noble Gases)</b>						
1. Total Release	Ci	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	N/A
2. Average diluted concentration during period	µCi/ml	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	
<b>D. Gross Alpha radioactivity</b>						
1. Total Release	Ci	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	2.3 E+01
<b>E. Volume of Waste Released</b>						
Retention Basins (prior to dilution)	Liters	0.00 E+00	1.39 E+06	1.54 E+06	1.35 E+06	5.0 E+00
<b>F. Volume of dilution water used during period</b>						
	Liters	5.44 E+09	4.86 E+09	2.99 E+09	4.27 E+09	2.0 E+01

RSNGS ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
 JANUARY - DECEMBER 2004

TABLE IV-B

LIQUID EFFLUENTS

<u>Nuclides Released</u>	<u>Batch Mode</u>				
	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
1. <u>Fission and activation products (excluding tritium, gases alpha)</u>					
Co-60	Ci	0.00 E+00	9.13 E-06	7.01 E-06	5.70 E-06
Sr-90	Ci	0.00 E+00	4.94 E-07	0.00 E+00	0.00 E+00
Cs-137	Ci	0.00 E+00	7.42 E-06	4.16 E-06	5.58 E-06
Total (for quarter)	Ci	0.00 E+00	1.70 E-05	1.12 E-05	1.13 E-05
2. <u>Dissolved and entrained gases</u>					
None					

**NOTE:** No continuous releases of liquid radioactive effluent are made from Rancho Seco Nuclear Generating Station.

RSNGS ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
JANUARY - DECEMBER 2004

TABLE IV-C

LIQUID EFFLUENTS - TYPICAL LOWER LIMITS OF DETECTION

<u>RADIONUCLIDES</u>	<u>BATCH MODE: LLD (<math>\mu\text{Ci}/\text{ml}</math>)</u>
1. Tritium (H-3)	2.60 E-06
2. Particulates:	
Manganese-54	2.11 E-09
Iron-59	3.71 E-09
Cobalt-57	2.12 E-09
Cobalt-58	1.93 E-09
Cobalt-60	1.98 E-09
Zinc-65	4.34 E-09
Strontium-90	5.00 E-10
Ruthenium-106	1.79 E-08
Silver-110m	1.94 E-09
Antimony-125	5.78 E-09
Cesium-134	1.93 E-09
Cesium-136	2.23 E-09
Cesium-137	2.30 E-09
Barium-140	7.75 E-09
Cerium-141	3.60 E-09
Cerium-144	1.59 E-08
3. Dissolved and Entrained Gases:	
Krypton-85	4.87 E-07

RSNGS ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT  
JANUARY - DECEMBER 2004

TABLE IV-D

RADIOLOGICAL IMPACT ON MAN DUE TO LIQUID EFFLUENT RELEASES

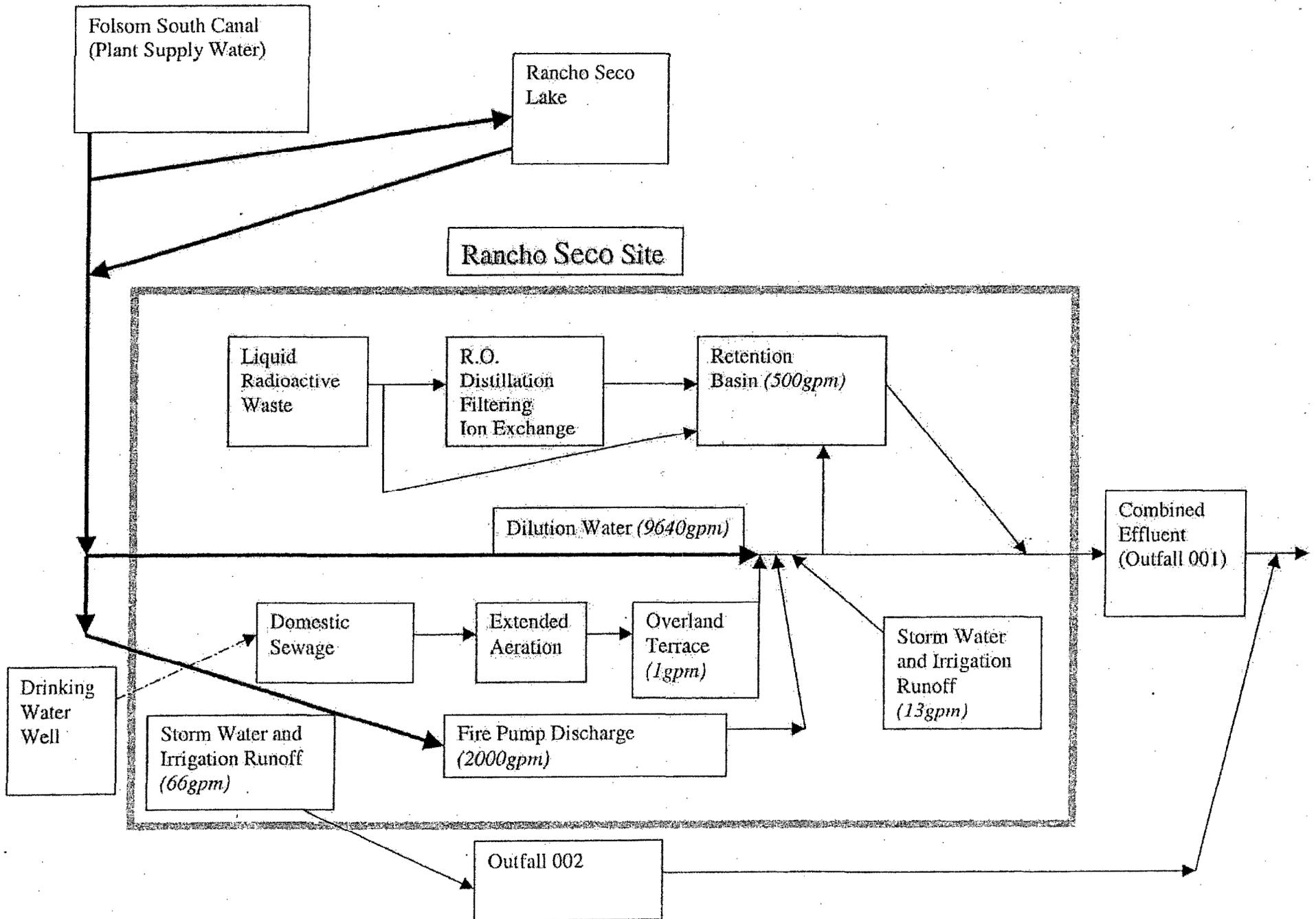
CALCULATED RADIATION DOSE COMMITMENTS FOR LIQUID EFFLUENTS:

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>	<u>2004 Annual</u>
A. Maximum Total Body Dose	mrem	0.00 E+00	2.21 E-03 (a)	6.56 E-03 (a)	1.59 E-03 (a)	1.04 E-02
Percent Tech Req limit	%	0.00 E+00	1.47 E-01	4.37 E-01	1.06 E-01	3.45 E-01
B. Maximum Organ Dose	mrem	0.00 E+00	6.99 E-03 (b)	1.32 E-02 (b)	3.24 E-03 (b)	2.34 E-02
Percent Tech Req limit	%	0.00 E+00	1.40 E-01	2.64 E-01	6.48 E-02	2.34 E-01

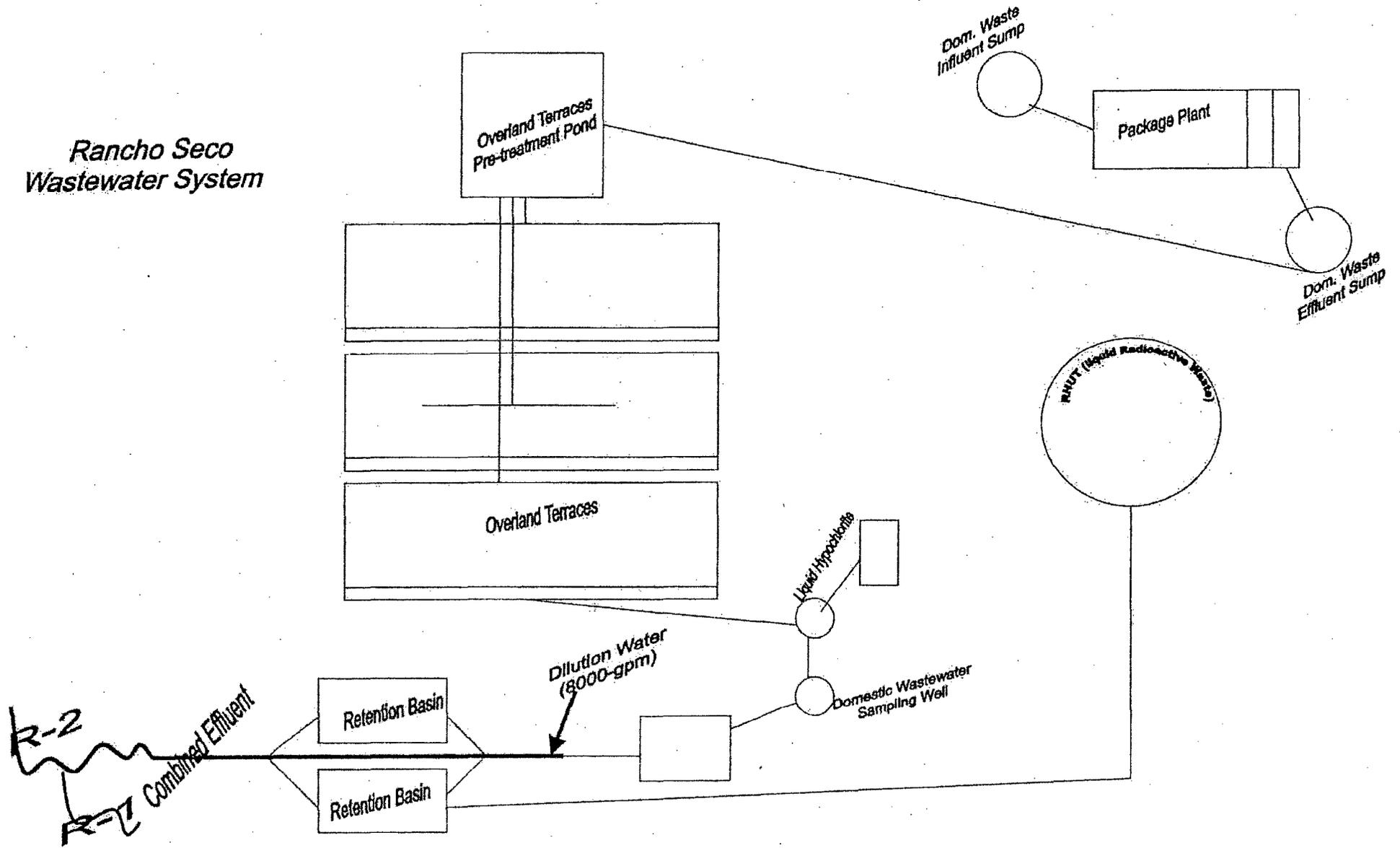
**Note:** The quarterly doses listed above were calculated using dose factors from LADTAP and the average dilution flow (cfs) for each respective quarter. Annual doses are the sum of quarterly doses.

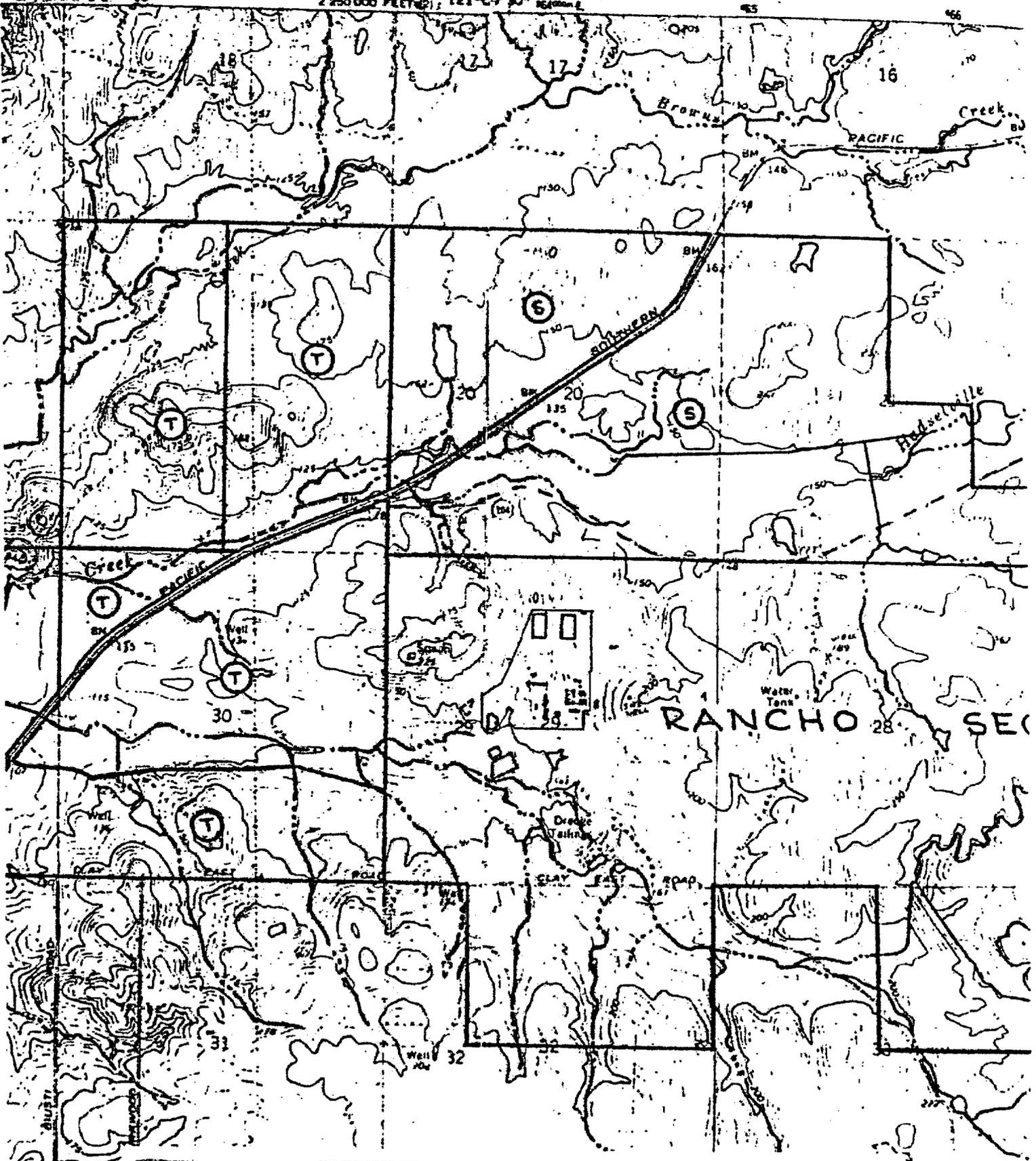
---

(a) Adult  
(b) Child - Bone



# Rancho Seco Wastewater System





CLAY QUADRANGLE  
 CALIFORNIA  
 7.5 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 GEOLOGICAL SURVEY



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The Power To Do More.®

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MPC&D 06-030

February 27, 2006

Mr. Thomas R. Pinkos  
Executive Officer  
California Regional Water Quality Control Board  
Central Valley Region  
11020 Sun Center Drive #200  
Rancho Cordova, CA 95670-6114

**ADDITIONAL INFORMATION FOR RENEWAL OF RANCHO SECO WASTE DISCHARGE  
REQUIREMENTS (NPDES NO. CA0004758)**

Reference: Application for Renewal of Rancho Seco Waste Discharge Requirements  
(NPDES Permit No. CA0004758), MPC&D 05-121, dated November 30, 2005.

Dear Mr. Pinkos:

The Sacramento Municipal Utility District (the District) hereby submits the enclosed additional information for renewal of Rancho Seco Wastewater Discharge Requirements for your review (EPA Form 2C).

Due to the seasonal nature of our treated sewage discharges, additional monitoring was performed to assist in the evaluation of our effluent. These additional samples were obtained once the wet weather season began and Rancho Seco resumed treated sewage discharges. The District submits the enclosed EPA Form 2C and copies of the analytical data reports from Sierra Foothill Laboratory.

Members of your staff requiring additional information or clarification may contact  
Mr. Brad Gacke at (916) 732-4812.

Sincerely,

Steve Redeker, Manager  
Plant Closure and Decommissioning

Enclosure

Cc w/Encls: Patricia Leary, California Regional Water Quality Control Board, Central Valley Region

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER (copy from Item 1 of Form 1)

CA0004758

V. INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)

OUTFALL NO.  
001

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT						d. NO. OF ANALYSES	3. UNITS (specify if blank)		4. INTAKE (optional)		
	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)			a. CONCENTRATION	b. MASS	b. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Biochemical Oxygen Demand (BOD)	1.9	310					2	mg/L	lbs			
b. Chemical Oxygen Demand (COD)	18	2937					2	mg/L	lbs			
c. Total Organic Carbon (TOC)	2.6	424					2	mg/L	lbs			
d. Total Suspended Solids (TSS)												
e. Ammonia (as N)	<0.50	<82					2	mg/L	lbs			
f. Flow	VALUE 19.55		VALUE		VALUE			MGD	N/A	VALUE		
g. Temperature (winter)	VALUE		VALUE		VALUE			°C		VALUE		
h. Temperature (summer)	VALUE		VALUE		VALUE			°C		VALUE		
i. pH	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	X			STANDARD UNITS		X		

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'		3. EFFLUENT						4. UNITS		5. INTAKE (optional)			
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	b. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Bromide (24959-67-9)														
b. Chlorine, Total Residual														
c. Color														
d. Fecal Coliform	X		130	N/A					2	MPN/100ml	N/A			
e. Fluoride (18984-48-8)														
f. Nitrate-Nitrite (as N)	X		<0.05	<8					2	mg/L	lbs			

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
PO Box 1268  
Jackson, CA 95642

Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

SMUD - Rancho Seco  
Attn: Brad Gacke  
14440 Twin Cities Rd  
Herald, CA 95638-

Report Date: 01/10/2006  
Page 1 of 3  
Client: SMUD

Project Report: 129992

## Results for Project 129992

### 592256 Comp plant effluent G WW

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	CAS
Nitrate + Nitrite as N	<0.050	mg/L		0.050	EPA300.0/SM4110B	01/04/2006 1130	TN	preserved
Nitrogen, Organic (TKN-NH3)	<1.0	mg/L		1.0	EPA310.2	01/10/2006 0000	KL	
Nitrogen, Ammonia-N	<0.50	mg/L		0.50	EPA350.2/SM4500-NH3	12/29/2005 0930	RK	
Nitrogen, Total Kjeldahl-N	<1.0	mg/L		1.0	EPA351.3/SM4500NH3	01/09/2006 1330	L&T	
Biochem Oxygen Demand, 5 day	<1.0	mg/L		1.0	EPA405.1/SM5210B	12/22/2005 1130	DS	
Chemical Oxygen Demand	<10	mg/L		10	EPA410.4/SM5220D	12/29/2005 1120	LG	
Total Organic Carbon	1.7	mg/L		0.30	EPA415.1/SM5310C	12/28/2005 1500	LK	

Liquid Taken: 12/22/2005 0910 By: PH Rec:12/22/2005

## Sample Preparation Steps for Project 129992

### 592256 Comp plant effluent G WW

Parameter	Result	Unit	Method	Analyzed	By
BOD Start Date	12/22/2005	Date		12/22/2005 1130	DS

Liquid Taken: 12/22/2005 0910 By: PH Rec:12/22/2005

## SET Quality Control/Quality Assurance for Project 129992

### Biochem Oxygen Demand, 5 day

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	206	200	mg/L	103.0	
	Blank	<0.1		mg/L		
	Seed Drop	1.4		mg/L		

(Analyzed: 12/22/2005 1130 DS Verified: 12/28/2005 10:56 DEG)

### Chemical Oxygen Demand

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	303	300	mg/L	101.0	
	Blank	<10		mg/L		
592291	Duplicate	151	158	mg/L		4.5
592302	Duplicate	77	84	mg/L		8.7
592137	Matrix SPK	166	200	mg/L	83%	
592170	Matrix SPK	212	200	mg/L	106%	

(Analyzed: 12/29/2005 1120 LG Verified: 12/29/2005 15:36 DEG)

Sierra Foothill Laboratory is certified by the State of California Dept. of Health Services  
for drinking water, wastewater, hazardous waste, and aquatic toxicity testing

Continued

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
PO Box 1268  
Jackson, CA 95642

Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

Report Date: 01/10/2006  
Page 2 of 3  
Client: SMUD  
Project Report: 129992

## SET Quality Control/Quality Assurance for Project 129992

### Nitrogen, Ammonia-N

(Analyzed: 12/29/2005 0930 RK Verified: 12/29/2005 15:36 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	753	780	mg/L	96.5	
	Blank	<0.50		mg/L		
592151	Duplicate	3.9	3.8	mg/L		2.6
592179	Duplicate	6.0	5.9	mg/L		1.7
592511	Duplicate	3.9	3.8	mg/L		2.6
592058	Matrix SPK	15.0	16	mg/L	94%	
592247	Matrix SPK	15.0	16	mg/L	94%	
592430	Matrix SPK	15.0	16	mg/L	94%	

### Nitrate + Nitrite as N

(Analyzed: 01/04/2006 1130 TN Verified: 01/05/2006 12:19 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	0.457	0.452	mg/L	101.1	
	Standard	0.462	0.452	mg/L	102.2	
	Standard	0.463	0.452	mg/L	102.4	
	LCS	1.368	1.36	mg/L	100.6	
	Blank	<0.050		mg/L		
592152	Duplicate	0.21	0.21	mg/L		0.0
592152	Matrix SPK	1.35	1.36	mg/L	99	
592152	MS Dup	1.36	1.36	mg/L	100	1.01

### Nitrogen, Total Kjeldahl-N

(Analyzed: 01/09/2006 1330 L&T Verified: 01/09/2006 16:32 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	720	780	mg/L	92.3	
	Blank	<1.0		mg/L		
592481	Duplicate	13	13	mg/L		0.0
592768	Duplicate	<1.0	<1.0	mg/L		0.0
592465	Matrix SPK	18.8	20	mg/L	94%	
592760	Matrix SPK	18.2	20	mg/L	91%	

### Total Organic Carbon

(Analyzed: 12/28/2005 1500 LK Verified: 12/29/2005 15:40 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	5.0	5.0	mg/L	100.0	
	Standard	5.0	5.0	mg/L	100.0	
	Standard	5.0	5.0	mg/L	100.0	
	Standard	5.0	5.0	mg/L	100.0	
	Blank	<0.30		mg/L		
	Blank	<0.30		mg/L		
	Blank	<0.30		mg/L		
	Blank	<0.30		mg/L		
591879	Duplicate	10	9.3	mg/L		7.3
591945	Duplicate	1.7	1.7	mg/L		0.0

Sierra Foothill Laboratory is certified by the State of California Dept. of Health Services  
for drinking water, wastewater, hazardous waste, and aquatic toxicity testing

Continued

# Sierra Foothill Laboratory, Inc.

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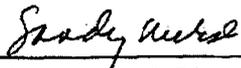
Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

Report Date: 01/10/2006  
Page 3 of 3  
Client: SMUD  
Project Report: 129992

## SET Quality Control/Quality Assurance for Project 129992

Total Organic Carbon			(Analyzed: 12/28/2005 1500 LK Verified: 12/29/2005 15:40 DEG)			
Sample	Type	Result	Value	Unit	Recovery (%)	RPD
591946	Duplicate	1.3	1.2	mg/L		8.0
591963	Duplicate	0.91	0.89	mg/L		2.2
591964	Duplicate	0.88	0.86	mg/L		2.3
591988	Duplicate	<0.30	<0.30	mg/L		0.0
592093	Duplicate	3.3	3.5	mg/L		5.9
592096	Duplicate	4.5	4.3	mg/L		4.5
592193	Duplicate	2.7	2.7	mg/L		0.0
592195	Duplicate	2.3	2.3	mg/L		0.0
592256	Duplicate	1.7	1.5	mg/L		12.5
592257	Duplicate	4.5	4.4	mg/L		2.2
592287	Duplicate	1.8	1.7	mg/L		5.7
592288	Duplicate	1.7	1.6	mg/L		6.1
591879	Matrix SPK	28.8	25	mg/L	115	
591879	MS Dup	26.8	25	mg/L	107	7.21
591963	Matrix SPK	9.70	10	mg/L	97	
591963	MS Dup	10.2	10	mg/L	102	5.03
592193	Matrix SPK	10.0	10	mg/L	100	
592193	MS Dup	9.80	10	mg/L	98	2.02
592288	Matrix SPK	9.90	10	mg/L	99	
592288	MS Dup	10.4	10	mg/L	104	4.93

ELAP Certificate #1113



Sandy Nurse, Lab Director

**Sierra Foothill Laboratory, Inc.**  
Chain of Custody

12/20/05

Page 1 of 1

**SMUD**

SMUD - Rancho Seco  
Attn: Brad Gacke  
14440 Twin Cities Rd  
Herald, CA 95638-

Lab Number

592250-01/B

Phone: 916/732-4812

Fax: 916/732-4833

Atten:

Comp plant effluent

NP1

**Sample**

Collected

Date: 12-22-05  
Time: 0910  
Signature: Brad Gacke

**Bottle Information**

- 01 / 1 Glass H2SO4 preserved for TOC  
4 C: TOC
- 02 / 1 Plastic H2SO4 to pH <2  
4 C: COD NH3 NO3+ ORGN TKN
- 03 / 1 Plastic unpreserved  
4 C: BOD BOST

**Requested Lab Tests**

Biochem Oxygen Demand, 5 day	BOD	mg/L	W	EPA405.1/SM5210B
BOD Start Date	BOST	Date	W	
Chemical Oxygen Demand	COD	mg/L	W	EPA410.1/SM5220D
Nitrogen, Ammonia-N	NH3	mg/L	W	EPA350.2/SM4500-NH3C
Nitrate + Nitrite as N	NO3+	mg/L	O	EPA300.0/SM4110B
Total Nitrogen-N	NTOT	mg/L	W	Calculation
Nitrogen, Organic (TKN-NH3)	ORGN	mg/L	W	EPA310.2
Nitrogen, Total Kjeldahl-N	TKN	mg/L	W	EPA351.3/SM4500NH3 C
Total Organic Carbon	TOC	mg/L	W	EPA415.1/SM5310C

Color clear      Odor None      Appearance good

**Comments**

Relinquished by: <u>Brad Gacke</u>	Date: <u>12-22-05</u>	Time: <u>1039</u>	Received by: <u>A. Carter</u>	Date: <u>12-22</u>	Time: <u>1039</u>
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Samples Received on Ice?  Yes  No Method of Shipment:  UPS  Bus  Fed-Ex  Lone Star  Hand Delivered  Other

Cooler/Sample Secure?  Yes  No Tracking or Shipping Number: \_\_\_\_\_

8-20  
12/22/05

12/22/05

**Sierra Foothill Laboratory, Inc.**  
Chain of Custody

12/20/05

Page 1 of 1

**SMUD**

SMUD - Rancho Seco  
Attn: Brad Gacke  
14440 Twin Cities Rd  
Herald, CA 95638-

Lab Number 592256

Phone: 916/732-4812

Fax: 916/732-4833

Atten:

**Comp plant effluent**

**NP1**

**Sample**

Collected

Date: 12-22-05

Time: 0910

Signature: Pamela Ward

**Bottle Information**

1 Glass H2SO4 preserved for TOC

4 C: TOC

1 Plastic H2SO4 to pH <2

4 C: COD NH3 NO3+ ORGN TKN

1 Plastic unpreserved

4 C: BOD BOST

**Requested Lab Tests**

Biochem Oxygen Demand, 5 day	BOD	mg/L	W	EPA405.1/SM5210B
BOD Start Date	BOST	Date	W	
Chemical Oxygen Demand	COD	mg/L	W	EPA410.1/SM5220D
Nitrogen, Ammonia-N	NH3	mg/L	W	EPA350.2/SM4500-NH3C
Nitrate + Nitrite as N	NO3+	mg/L	O	EPA300.0/SM4110B
Total Nitrogen-N	NTOT	mg/L	W	Calculation
Nitrogen, Organic (TKN-NH3)	ORGN	mg/L	W	EPA310.2
Nitrogen, Total Kjeldahl-N	TKN	mg/L	W	EPA351.3/SM4500NH3 C
Total Organic Carbon	TOC	mg/L	W	EPA415.1/SM5310C

Color clear Odor NONE Appearance good

**Comments**

Relinquished by: <u>Pamela Ward</u>	Date: <u>12-22-05</u>	Time: <u>1039</u>	Received by: <u>A. Carter</u>	Date: <u>12-22</u>	Time: <u>1035</u>
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Samples Received on Ice?  Yes  No Method of Shipment:  UPS  Bus  Fed-Ex  Lone Star  Hand Delivered  Other

Cooler/Sample Secure?  Yes  No Tracking or Shipping Number: \_\_\_\_\_

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
PO Box 1268  
Jackson, CA 95642

Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

Report Date: 01/12/2006  
Page 1 of 3  
Client: SMUD

SMUD - Rancho Seco  
Attn: Brad Gacke  
14440 Twin Cities Rd.  
Herald, CA 95638-

Project Report: 130101

## Results for Project 130101

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	CAS
Ammonia + Nitrite as N	<0.050	mg/L		0.050	EPA300.0/SM4110B	01/04/2006 1130 TN		preserved
Nitrogen, Organic (TKN-NH3)	<1.0	mg/L		1.0	EPA310.2	01/10/2006 0000 KL		
Nitrogen, Ammonia-N	<0.50	mg/L		0.50	EPA350.2/SM4500-NH3	12/29/2005 0930 RK		
Nitrogen, Total Kjeldahl-N	<1.0	mg/L		1.0	EPA351.3/SM4500NH3	01/09/2006 1330 L&T		
Biochem Oxygen Demand, 5 day	1.9	mg/L		1.0	EPA405.1/SM5210B	12/28/2005 1330 MG		
Chemical Oxygen Demand	18	mg/L		10	EPA410.4/SM5220D	01/11/2006 1145 LG		
Total Organic Carbon	2.6	mg/L		0.30	EPA415.1/SM5310C	12/29/2005 1510 LK		

## Sample Preparation Steps for Project 130101

Parameter	Result	Unit	Method	Analyzed	By
COD Start Date	12/28/2005	Date		12/28/2005 1330	MG

## SET Quality Control/Quality Assurance for Project 130101

Sample	Biochem Oxygen Demand, 5 day		(Analyzed: 12/28/2005 1330 MG Verified: 01/04/2006 11:30 DEG)			
	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	212	200	mg/L	106.0	
	Blank	0.2		mg/L		
	Seed Drop	1.1		mg/L		

Sample	Chemical Oxygen Demand		(Analyzed: 01/11/2006 1145 LG Verified: 01/12/2006 10:22 DEG)			
	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	299	300	mg/L	99.7	
	Blank	<10		mg/L		
32414	Duplicate	849	831	mg/L		2.1
32493	Matrix SPK	196	200	mg/L	98%	

Sample	Nitrogen, Ammonia-N		(Analyzed: 12/29/2005 0930 RK Verified: 12/29/2005 15:36 DEG)			
	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	753	780	mg/L	96.5	
	Blank	<0.50		mg/L		
32151	Duplicate	3.9	3.8	mg/L		2.6

Sierra Foothill Laboratory is certified by the State of California Dept. of Health Services  
for drinking water, wastewater, hazardous waste, and aquatic toxicity testing

Continued

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
PO Box 1268  
Jackson, CA 95642

Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

Report Date: 01/12/2006  
Page 2 of 3  
Client: SMUD  
Project Report: 130101

## SET Quality Control/Quality Assurance for Project 130101

### Nitrogen, Ammonia-N

(Analyzed: 12/29/2005 0930 RK Verified: 12/29/2005 15:36 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
2179	Duplicate	6.0	5.9	mg/L		1.7
2511	Duplicate	3.9	3.8	mg/L		2.6
2058	Matrix SPK	15.0	16	mg/L	94%	
2247	Matrix SPK	15.0	16	mg/L	94%	
2430	Matrix SPK	15.0	16	mg/L	94%	

### Nitrate + Nitrite as N

(Analyzed: 01/04/2006 1130 TN Verified: 01/05/2006 12:19 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	0.457	0.452	mg/L	101.1	
	Standard	0.462	0.452	mg/L	102.2	
	Standard	0.463	0.452	mg/L	102.4	
	LCS	1.368	1.36	mg/L	100.6	
	Blank	<0.050		mg/L		
2152	Duplicate	0.21	0.21	mg/L		0.0
2152	Matrix SPK	1.35	1.36	mg/L	99	
2152	MS Dup	1.36	1.36	mg/L	100	1.01

### Nitrogen, Total Kjeldahl-N

(Analyzed: 01/09/2006 1330 L&T Verified: 01/09/2006 16:32 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	720	780	mg/L	92.3	
	Blank	<1.0		mg/L		
2481	Duplicate	13	13	mg/L		0.0
2768	Duplicate	<1.0	<1.0	mg/L		0.0
2465	Matrix SPK	18.8	20	mg/L	94%	
2760	Matrix SPK	18.2	20	mg/L	91%	

### Total Organic Carbon

(Analyzed: 12/29/2005 1510 LK Verified: 01/03/2006 10:05 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	10	10	mg/L	100.0	
	Standard	9.9	10	mg/L	99.0	
	Standard	9.5	10	mg/L	95.0	
	Standard	10	10	mg/L	100.0	
	Blank	<0.30		mg/L		
	Blank	<0.30		mg/L		
	Blank	<0.30		mg/L		
	Blank	<0.30		mg/L		
2094	Duplicate	10	9.4	mg/L		6.2
2095	Duplicate	9.4	9.9	mg/L		5.2
2097	Duplicate	5.4	5.3	mg/L		1.9
2211	Duplicate	4.8	4.8	mg/L		4.3
2212	Duplicate	8.9	9.3	mg/L		4.4

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Continued

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
PO Box 1268  
Jackson, CA 95642

Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

Report Date: 01/12/2006  
Page 3 of 3  
Client: SMUD  
Project Report: 130101

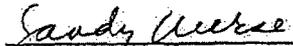
## SET Quality Control/Quality Assurance for Project 130101

### Total Organic Carbon

(Analyzed: 12/29/2005 1510 LK Verified: 01/03/2006 10:05 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
12290	Duplicate	3.0	3.3	mg/L		9.5
12300	Duplicate	71	76	mg/L		6.8
12490	Duplicate	13	13	mg/L		0.0
12491	Duplicate	3.1	3.1	mg/L		0.0
12493	Duplicate	2.6	2.4	mg/L		8.0
12543	Duplicate	7.0	7.1	mg/L		1.4
12095	Matrix SPK	19.6	20	mg/L	98	
12095	MS Dup	20.2	20	mg/L	101	3.02
12212	Matrix SPK	19.6	20	mg/L	98	
12212	MS Dup	18.2	20	mg/L	91	7.41
12493	Matrix SPK	19.4	20	mg/L	97	
12493	MS Dup	19.4	20	mg/L	97	0

LAP Certificate #1113

  
Sandy Nurse, Lab Director

Sierra Foothill Laboratory is certified by the State of California Dept. of Health Services  
for drinking water, wastewater, hazardous waste, and aquatic toxicity testing

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
PO Box 1268  
Jackson, CA 95642

Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

## Sierra Foothill Laboratory, Inc. Chain of Custody

12/20/05  
Page 1 of 1

**SMUD**  
SMUD - Rancho Seco  
Aith: Brad Gacke  
14440 Twin Cities Rd  
Herald, CA 95638

Lab Number: 592493-01/03  
Phone: 916/732-4812  
Fax: 916/732-4833  
Atten:

Comp plant effluent

NP1

### Sample

Collected  
Date: 12-24-05  
Time: 0855  
Signature: Brad Gacke

### Bottle Information

- 01 Glass H2SO4 preserved for TOC  
4 C: TOC
- 02 Plastic H2SO4 to pH <2  
4 C: COD NH3 NO3+ ORGN TKN
- 03 Plastic unpreserved  
4 C: BOD BOST

### Requested Lab Tests

Biochem Oxygen Demand, 5 day	BOD	mg/L	W	EPA405.1/SM5210B
BOD Start Date	BOST	Date	W	
Chemical Oxygen Demand	COD	mg/L	W	EPA410.1/SM5220D
Nitrogen, Ammonia-N	NH3	mg/L	W	EPA350.2/SM4500-NH3C
Nitrate + Nitrite as-N	NO3+	mg/L	O	EPA300.0/SM4110B
Total Nitrogen-N	NTOT	mg/L	W	Calculation
Nitrogen, Organic (TKN-NH3)	ORGN	mg/L	W	EPA310.2
Nitrogen, Total Kjeldahl-N	TKN	mg/L	W	EPA351.3/SM4500NH3 C
Total Organic Carbon	TOC	mg/L	W	EPA415.1/SM5310C

Color Clear Odor None Appearance SAT

### Comments

Relinquished by: <u>Brad Gacke</u>	Date: <u>12/24/05</u>	Time: <u>0930</u>	Received by: <u>[Signature]</u>	Date: <u>12/28/05</u>	Time: <u>0930</u>
Relinquished by: <u>[Signature]</u>	Date: <u>12/28/05</u>	Time: <u>153</u>	Received by: <u>[Signature]</u>	Date: <u>12/28</u>	Time: <u>153</u>
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Samples Received on Ice?  Yes  No Method of Shipment:  UPS  Bus  Fed-Ex  Lone Star  Hand Delivered  Other

Cooler/Sample Secure?  Yes  No Tracking or Shipping Number: \_\_\_\_\_

14.20  
09/10/05

TB  
12/28/05

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
PO Box 1268  
Jackson, CA 95642

Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

Report Date: 01/04/2006  
Page 1 of 1  
Client: SMUD

SMUD - Rancho Seco  
Attn: Brad Gacke  
14440 Twin Cities Rd  
Herald, CA 95638-

Project Report: 129991

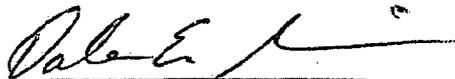
## Results for Project 129991

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	CAS
Asbestos	<0.2	MFL		0.20	EPA/600/R-94/134	12/23/2005 1540	FOR	
Oil & Grease	ND	mg/L		5.0	SM55203/F	12/28/2005 0000	MCC	
Total Coliform Bacteria, 15 t	7	#/100ml		2	SM9221B	12/22/2005 1340	MG	
Fecal Coliform Bacteria, 15 t	<2	#/100ml		2	SM9221E	12/22/2005 1340	MG	

## Sample Preparation Steps for Project 129991

Parameter	Result	Unit	Method	Analyzed	By
Receive report from sub lab	Forens 01/04/06	Date		01/04/2006 0000	KL
Receive report from sub lab	McCam 01/03/06	Date		01/03/2006 0000	KL
Ship samples to sub lab	McCam 12/27/05	Date		12/27/2005 1400	DEG
Ship samples to sub lab	Forens 12/22/05	Date		12/22/2005 1400	DEG

ELAP Certificate #1113



Sandy Nurse, Lab Director

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
 PO Box 1268  
 Jackson, CA 95642

Phone 209/223-2800  
 Fax 209/223-2747  
 Email info@sierralab.com

## Sierra Foothill Laboratory, Inc. Chain of Custody

12/20/05  
 Page 1 of 1

**SMUD**  
 SMUD - Rancho Seco  
 Attn: Brad Gacke  
 14440 Twin Cities Rd  
 Herald, CA 95638

Lab Number: 591255-01103  
 Phone: 916/732-4812  
 Fax: 916/732-4833  
 Atten:

**PE Grab effluent**

**NP2**

**Sample**

Collected

Date: 12-22-05  
 Time: 09:57  
 Signature: [Signature]

**Bottle Information**

- 01 ✓ Glass 1L HCL to pH <2  
 4 C: O&G
- 02 ✓ Plastic 125 ml Sterilized Sodium Thiosulfate for Bactl  
 4 C: FC15 tc15 121967
- 03 ✓ Plastic 500ml-unpres for Asbestos  
 4 C: Asb

**Requested Lab Tests**

NOTIFY SHIP IMMEDIATELY !!

Asbestos	Asb	MFL	S	EPA/600/R-94/134
Fecal Coliform Bacteria, 15 tube	FC15	#/100ml	W	SM9221E
Oil & Grease	O&G	mg/L	S	SM5520B/F
Receive report from sub lab	Recv	Date	S	
Ship samples to sub lab	Ship	Date	S	
Total Coliform Bacteria, 15 tube	tc15	#/100ml	W	SM9221B
Color <u>clear</u>	Odor <u>NOAR</u>	Appearance <u>good</u>		

**Comments**

Relinquished by: <u>[Signature]</u>	Date: <u>12-22-05</u>	Time: <u>10:39</u>	Received by: <u>[Signature]</u>	Date: <u>12-22</u>	Time: <u>10:39</u>
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Samples Received on Ice?  Yes  No Method of Shipment:  UPS  Bus  Fed-Ex  Lone Star  Hand Delivered  Other  
 Cooler/Sample Secure?  Yes  No Tracking or Shipping Number:

8720 onel

TR 12/22/05



 <b>McC Campbell Analytical, Inc.</b>	110 2nd Avenue South, #D7, Pacifico, CA 94553-5360 Telephone: 925-798-1620 Fax: 925-798-1622 Website: www.mcccampbell.com E-mail: maito@mcccampbell.com
	110 2nd Avenue South, #D7, Pacifico, CA 94553-5360 Telephone: 925-798-1620 Fax: 925-798-1622 Website: www.mcccampbell.com E-mail: maito@mcccampbell.com

**QC SUMMARY REPORT FOR SM5520B/F**

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0512472

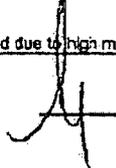
EPA Method: SM5520B/F		Extraction: PRHEM-SGT_W			BatchID: 19629			Spiked Sample ID: N/A		
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/L	mg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
POG	N/A	100	N/A	N/A	N/A	110	110	0	N/A	70 - 130
All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions: NONE										

**BATCH 19629 SUMMARY**

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0512472-001A	12/22/05 9:17 AM	12/28/05	12/29/05 4:34 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 % Recovery =  $100 * (MS - Sample) / (Amount Spiked)$ ;  $RPD = 100 * (MS - MSD) / ((MS + MSD) / 2)$ .  
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

 QA/QC Officer

**McC Campbell Analytical, Inc.**110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
Website: www.mccampbell.com Email: main@mccampbell.com**INVOICE for ANALYTICAL SERVICES**Project Name: #592255-592291  
PO Number: N/A  
Date Sampled: 12/22/05  
Date Received: 12/28/05**Invoice N°: 0512472**INV DATE: *December 30, 2005*  
Print DATE: *December 30, 2005*Report To: Sandy Nurse  
Sierra Foothill Laboratory  
255 Scottsville Blvd.  
Jackson, CA 95642Invoice To: Accounts Payable  
Sierra-Foothill Laboratory  
255 Scottsville Blvd.  
Jackson, CA 95642

Description	TAT	Matrix	Qty	Mult	Unit Price	Test Total
<b>Tests:</b>						
Oil & Grease (5520B with Silica Gel Clean-Up)	5 days	Water	2	1	\$50.00	\$100.00
Oil & Grease (5520B without Silica Gel Clean-Up)	5 days	Water	1	1	\$50.00	\$50.00
<b>SubTotal:</b>						<b>\$150.00</b>

**Invoice Total: \$150.00**

If paid by 02/03/06 Prompt Pay Invoice Total = \$135.00

**\* ALL FAXED INVOICES ARE FOR YOUR INFORMATION ONLY - PLEASE PAY OFF ORIGINAL**

Please include the invoice number with your check and remit to Accounts Receivable at the letter head address. MAI also accepts credit card (Visa/Master Card/Discover/American Express) payment. Please call Account Receivable for details on this service.

MAI's EDF charge does not include the EDF charge for subcontracted analyses. The minimum EDF charge per workorder is \$25.00. For invoice total greater than \$5000.00, EDF will be 2% of the total invoice. The EDF charge for subcontracted analyses will be identical to Subcontractor's fee.

Terms are net 30 days from the invoice date. After this period 10% interest will be charged annually. Overdue accounts are responsible for all legal and collection fees. If you have any questions about billing, please contact Accounts Receivable at McC Campbell Analytical.



### ANALYSIS REPORT ASBESTOS IN DRINKING WATER Transmission Electron Microscopy\*

Client: Sierra Foothill Laboratory  
Contact: Dale Gimble  
Street: PO Box 1268  
City/state/zip: Jackson CA 95642

Page: 1 of 1  
Client Number: A30195-2  
Report Number: T010015  
Date/time Received: 12/23/05 1030

Site:   
Job ID:   
P.O. #:   
Date/time collected: 12/22/05 0919  
Hold time, hrs: <48  
Filter type: 25mm Mixed Cellulose Ester  
Pore size: 0.22 µm

Date/time filtered: 12/23/05 1540  
Analyst(s): RE  
Date Analyzed: 1/3/06  
Date Reported: 1/3/06

ANALYTICAL RESULTS	
Client Sample Number	592255
Lab Sample Number	20039387
Volume Filtered, mL	30
Filter Area, mm <sup>2</sup>	190
Grid Opening Area, mm <sup>2</sup>	0.0093
Number of GOS Analyzed	4
Area Analyzed, mm <sup>2</sup>	0.0372
# Asbestos Fibers ≥10µm	0
Analytical Sensitivity, MFL	0.2
<b>Asbestos Concentration, &gt;10µm in length, MFL</b>	<b>&lt;0.2</b>
Asbestos Type(s) Detected**	ND
Water Blank Conc., MFL	n/a
95% Upper Conf. Limit	0.63
95% Lower Conf. Limit	0

Mark S. Floyd, EM Supervisor, Hayward Laboratory

\* Method 100.2 (EPA/600/R-94/134). Results are reported in Millions of Fibers per Liter (MFL) over 10 microns (µm) in length.  
\*\* Asbestos types: CH=chrysotile; AM=amosite; CR=crocidolite; AC=actinolite; TR=tremolite; AN=anthophyllite; ND=none detected.

SIERRA FOOTHILL LABORATORY  
 255 SCOTTSMILLE BLVD. • P.O. BOX 1288, JACKSON, CA 95642

592255

**SAMPLE FOR MICROBIOLOGICAL EXAMINATION**

PURVEYOR AND ADDRESS: Sierra - RS COUNTY: \_\_\_\_\_ DATE AND HOUR COLLECTED: 12-22-05/0917

SAMPLING POINT: RF SYSTEM NUMBER:  COLLECTED BY: PH BOTTLE NUMBER: 121967

TYPE OF SAMPLE:  DRINKING WATER (ANY SOURCE)  SEWAGE  RAW SURFACE WATER  
 OTHER (SPECIFY): \_\_\_\_\_

DEPT. HEALTH AT: \_\_\_\_\_  
 SEND REPORT TO: COUNTY HEALTH: \_\_\_\_\_ OTHER: \_\_\_\_\_

ANALYSES DESIRED AND REMARKS:  
 COLIFORM  FECAL COLIFORM  
 SPC TC15  OTHER FC15

RESULTS (TO BE FILLED IN BY LABORATORY ONLY)

TUBE NUMBER OR PORTIONS	1	2	3	4	5	6	7	8	9	10	COLIFORM MPN/100ml
PORTIONS IN ML (LOGS)	1	1	1	1	1	1	1	1	1	1	7
PRESUMPTIVE HOURS	24	24	24	24	24	24	24	24	24	24	E. C. MPN/100ml
1500	+	+	+	+	+	+	+	+	+	+	<2
CONFIRMED TEST	+	+	+	+	+	+	+	+	+	+	SPC/ml AT 35° C.
E. C.	+	+	+	+	+	+	+	+	+	+	CF RES. mg/liter

LABORATORY REMARKS

LEAKED IN TRANSIT  
 INSUFFICIENT SAMPLE

25257W 6605 1340 mg ANALYST: JB  
6455 12-22-05

**Sierra Foothill Laboratory, Inc.**  
Chain of Custody

12/20/05

Page 1 of 1

SMUD

SMUD - Rancho Seco

Attn: Brad Gacke

14440 Twin Cities Rd

Herald, CA 95638-

Lab Number \_\_\_\_\_

Phone: 916/732-4812

Fax: 916/732-4833

Atten: \_\_\_\_\_

PE Grab effluent

NP2

**Sample**

Collected

Date: 12-22-05

Time: 0917

Signature: [Signature]

**Bottle Information**

Glass 1L HCL to pH <2

4 C: O&G

Plastic 125 ml Sterilized Sodium Thiosulfate for Bacti

4 C: FC15 tc15

Plastic 500ml unpres for Asbestos

4 C: Asb

**Requested Lab Tests**

NOTIFY SHIP IMMEDIATLY !!

!@@!

S

Asbestos

Asb

MFL

S

EPA/600/R-94/134

Fecal Coliform Bacteria, 15 tube

FC15

#/100ml

W

SM9221E

Oil & Grease

O&G

mg/L

S

SM5520B/F

Receive report from sub lab

Recv

Date

S

Ship samples to sub lab

Ship

Date

S

Total Coliform Bacteria, 15 tube

tc15

#/100ml

W

SM9221B

Color clear

Odor NONE

Appearance good

**Comments**

Relinquished by: <u>[Signature]</u>	Date: <u>12-22-05</u>	Time: <u>1039</u>	Received by: <u>[Signature]</u>	Date: <u>12-22</u>	Time: <u>031</u>
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Samples Received on Ice?  Yes  No Method of Shipment:  UPS  Bus  Fed-Ex  Lone Star  Hand Delivered  Other

Cooler/Sample Secure?  Yes  No Tracking or Shipping Number: \_\_\_\_\_

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
PO Box 1268  
Jackson, CA 95642

Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

Report Date: 01/09/2006  
Page 1 of 1  
Client: SMUD

SMUD - Rancho Seco  
Attn: Brad Gacke  
14440 Twin Cities Rd  
Herald, CA 95638-

Project Report: 130102

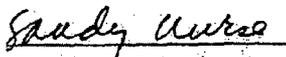
## Results for Project 130102

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	CAS
12494 Grab effluent G WW 101792 Liquid Taken: 12/28/2005 0900 By: RB Rec:12/28/2005								
SAMPLE SITE ON BOTTLES READS: "PE"								
bestos	<0.2	MFL		0.20	EPA/600/R-94/134	12/29/2005 1328	FOR	
l & Grease	ND	mg/L		5.0	SM5520B/F	12/30/2005 0000	MCC	
tal Coliform Bacteria, 15 t	170	#/100ml		2	SM9221B	12/28/2005 1440	MG	
cal Coliform Bacteria, 15.t	130	#/100ml		2	SM9221E	12/28/2005 1440	MG	

## Sample Preparation Steps for Project 130102

Parameter	Result	Unit	Method	Analyzed	By
12494 Grab effluent G WW 101792 Liquid Taken: 12/28/2005 0900 By: RB Rec:12/28/2005					
ceive report from sub lab	McCam 01/09/06	Date		01/09/2006 0000	KL
ceive report from sub lab	Forens 01/09/06	Date		01/09/2006 0000	KL
ip samples to sub lab	McCam 12/29/05	Date		12/28/2005 1400	DEG
ip samples to sub lab	Forens 12/28/05	Date		12/28/2005 1400	DEG

AP Certificate #1113

  
Sandy Nurse, Lab Director



 <b>McC Campbell Analytical, Inc.</b>	110 2nd Avenue South, #107, Pacheco, CA 94553-5560 Telephone : 925-798-1620 Fax : 925-798-1622 Website: www.mccampbell.com E-mail: main@mccampbell.com
--	--

**QC SUMMARY REPORT FOR SM5520B/F**

W.O. Sample Matrix: Water

QC Matrix: Water

WorkOrder: 0512535

EPA Method: SM5520B/F		Extraction: PRHEM-SGT_W			BatchID: 19629			Spiked Sample ID: N/A		
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/L	mg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
POG	N/A	100	N/A	N/A	N/A	110	110	0	N/A	70 - 130
All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions: NONE										

BATCH 19629 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0512535-002A	12/28/05 9:00 AM	12/30/05	1/03/06 9:52 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation  
 % Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / ((MS + MSD) / 2).  
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



**ANALYSIS REPORT**  
**ASBESTOS IN DRINKING WATER**  
**Transmission Electron Microscopy\***

Client: Sierra Foothill Laboratory  
Contact: Dale Gimble  
Street: PO Box 1268  
City/state/zip: Jackson CA 95642

Page: 1 of 1  
Client Number: A30195-2  
Report Number: T010027  
Date/Time Received: 12/29/05 0930

Site:  
Job ID:  
P.O. #:  
Date/time collected: 12/28/05 0900-1000  
Hold time, hrs: <48  
Filter type: 25mm Mixed Cellulose Ester  
Pore size: 0.22 µm

Date/time filtered: 12/29/05 1328  
Analyst(s): RE  
Date Analyzed: 1/5/06  
Date Reported: 1/5/06

**ANALYTICAL RESULTS**

Client Sample Number	592494	<del>502059</del>	<del>500070</del>
Lab Sample Number	20030443	<del>20000111</del>	<del>20000445</del>
Volume Filtered, mL	30	<del>30</del>	<del>30</del>
Filter Area, mm <sup>2</sup>	190	<del>190</del>	<del>190</del>
Grid Opening Area, mm <sup>2</sup>	0.0093	<del>0.0093</del>	<del>0.0093</del>
Number of GOs Analyzed	4	<del>4</del>	<del>4</del>
Area Analyzed, mm <sup>2</sup>	0.0372	<del>0.0372</del>	<del>0.0372</del>
# Asbestos Fibers ≥10µm	0	<del>0</del>	<del>0</del>
Analytical Sensitivity, MFL	0.2	<del>0.2</del>	<del>0.2</del>
Asbestos Concentration, >10µm in length, MFL	<0.2	<del>&lt;0.2</del>	<del>&lt;0.2</del>
Asbestos Type(s) Detected**	ND	<del>ND</del>	<del>ND</del>
Water Blank Conc., MFL	n/a	<del>n/a</del>	<del>n/a</del>
95% Upper Conf. Limit	0.63	<del>0.63</del>	<del>0.63</del>
95% Lower Conf. Limit	0	<del>0</del>	<del>0</del>

Mark S. Floyd, EM Supervisor, Hayward Laboratory

\* Method 100.2 (EPA/600/R-94/134). Results are reported in Millions of Fibers per Liter (MFL) over 10 microns (µm) in length.  
\*\* Asbestos types: CH=chrysotile; AM=amosite; CR=crocidolite; AC=actinolite; TR=tremolite; AN=anthophyllite; ND=none detected.

# Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd  
PO Box 1268  
Jackson, CA 95642

Phone 209/223-2800  
Fax 209/223-2747  
Email info@sierralab.com

## Sierra Foothill Laboratory, Inc. Chain of Custody

12/20/05  
Page 1 of 1

**SMUD**  
SMUD - Rancho Seco  
Attn: Brad Gacke  
14440 Twin Cities Rd  
Herald, CA 95638-

Lab Number 592494-01/03  
Phone: 916/732-4812  
Fax: 916/732-4833  
Atten:

Grab effluent: Bottles rec'd PE

NP2

**Sample**

Collected

Date: 12-28-05  
Time: 0900 after rec'd 12-28-05  
Signature: Bob Amnell

**Bottle Information**

- 01 Glass 1L HCL to pH <2  
4 C: O&G
- 02 Plastic 125 ml Sterilized Sodium Thiosulfate for Bacti  
4 C: FC15 tc15 101792
- 03 Plastic 500ml unpres for Asbestos  
4 C: Asb

**Requested Lab Tests**

NOTIFY SHIP IMMEDIATELY !!

Asbestos	Asb	MFL	S	EPA/600/R-94/134
Fecal Coliform Bacteria, 15 tube	FC15	#/100ml	W	SM9221E
Oil & Grease	O&G	mg/L	S	SM5520B/F
Receive report from sub lab	Recv	Date	S	
Ship samples to sub lab	Ship	Date	S	
Total Coliform Bacteria, 15 tube	tc15	#/100ml	W	SM9221B
Color <u>Clear</u>	Odor <u>None</u>	Appearance <u>SAT</u>		

Comments

Relinquished by: <u>Bob Amnell</u>	Date: <u>12/28/05</u>	Time: <u>0930</u>	Received by: <u>[Signature]</u>	Date: <u>12/28/05</u>	Time: <u>0930</u>
Relinquished by: <u>[Signature]</u>	Date: <u>12/28/05</u>	Time: <u>1153</u>	Received by: <u>[Signature]</u>	Date: <u>12/28/05</u>	Time: <u>1153</u>
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Samples Received on Ice?  Yes  No Method of Shipment:  UPS  Bus  Fed-Ex  Lone Star  Hand Delivered  Other  
Cooler/Sample Secure?  Yes  No Tracking or Shipping Number: \_\_\_\_\_

14.2c. over

7B  
12/28/05

R.O. Draft 9/16-1970

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
Central Valley Project, California

Contract No.  
14-06-200-5198A

CONTRACT BETWEEN THE UNITED STATES OF AMERICA AND SACRAMENTO  
MUNICIPAL UTILITY DISTRICT PROVIDING FOR WATER SERVICE

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1  
2 UNITED STATES  
3 DEPARTMENT OF THE INTERIOR  
4 BUREAU OF RECLAMATION  
5 Central Valley Project, California

Contract No.  
14-06-200-5198A

6 CONTRACT BETWEEN THE UNITED STATES OF AMERICA AND SACRAMENTO  
7 MUNICIPAL UTILITY DISTRICT PROVIDING FOR WATER SERVICE

8 THIS CONTRACT, made this 26 day of November, 1971,  
9 in pursuance generally of the Act of June 17, 1902 (32 Stat. 388),  
10 and acts amendatory thereof or supplementary thereto, all collectively  
11 hereinafter referred to as the Federal reclamation laws, between THE  
12 UNITED STATES OF AMERICA, hereinafter referred to as the United States,  
13 and the SACRAMENTO MUNICIPAL UTILITY DISTRICT, hereinafter referred  
14 to as the District, a public agency of the State of California,  
15 duly organized, existing, and acting pursuant to the laws thereof,  
16 with its principal place of business in Sacramento, California,

17 WITNESSETH, That:

18 EXPLANATORY RECITALS

19 WHEREAS, the United States is constructing and operating  
20 the Central Valley Project, California, for the purpose, among others,  
21 of furnishing water for irrigation, municipal, industrial, domestic,  
22 and other beneficial uses; and

WHEREAS, the United States is authorized to construct  
the Auburn-Folsom South Unit as an integral part of the Central

Preamble  
Explanatory Recitals--

1 Valley Project and there will be available from that Unit a water  
2 supply for the District for municipal, industrial, and domestic  
3 use, which will not impair the efficiency of the Project for irrigation  
4 purposes; and

5 WHEREAS, the District has a potential need of a water  
6 supply and desires to contract for the furnishing by the United  
7 States of such supply; and

8 WHEREAS, investigations of the streamflow of the Sacramento,  
9 the Trinity, the American, and the San Joaquin Rivers and their  
10 tributaries indicate that there will be available for furnishing  
11 to the District the quantities of water herein provided for; and

12 WHEREAS, an agreement of assignment entered into by  
13 the District and the City of Sacramento, a municipal corporation,  
14 under date of June 28, 1957, provides in part that said City shall  
15 allow the District upon request to divert up to 20 cubic feet  
16 per second of water from the American or Sacramento River to which  
17 the City has a right under its applications for consumptive use;  
18 and

19 WHEREAS, the United States is willing to furnish water to  
20 the District from Project supplies available for municipal, industrial,  
21 and domestic use from that Unit and is willing to transmit to  
22 the District through the Canal the 20 cubic feet per second of

1 water [ ] which for convenience in administering this contract shall  
2 be deemed to be equivalent to 40 acre-feet per day [ ] referred to  
3 in the preceding paragraph;

4 NOW, THEREFORE, in consideration of the covenants herein  
5 contained, it is agreed as follows:

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1 (e) "initial delivery date" shall mean January 1 of the  
2 year in which the Secretary announces that water from the  
3 Canal is first available for delivery to the District under  
4 this contract;

5 (f) "year" shall mean a calendar year; and

6 (g) "fiscal year" shall mean the period commencing July 1  
7 and ending the following June 30.

8 TERM OF CONTRACT--BENEFICIAL USE

9 2. (a) This contract shall be effective on the date first  
10 hereinabove written and shall remain in effect for a period of  
11 40 years, commencing with the year in which the Contracting Officer  
12 announces that water is available from the Canal to any customers  
13 holding long-term contracts for service therefrom: Provided, That  
14 under terms and conditions agreeable to the parties, renewals of  
15 this contract may be made for successive periods not to exceed  
16 40 years each. The terms and conditions of each renewal shall  
17 be agreed upon not later than 1 year prior to the expiration of  
18 the then existing contract.

19 (b) The right to the beneficial use of water furnished  
20 to the District pursuant to this contract and any renewal hereof  
21 shall not be disturbed so long as the District fulfills all of  
22 its obligations under this contract and such renewal.

WATER TO BE FURNISHED TO THE DISTRICT

1  
2       3.   (a) The United States shall use all reasonable diligence  
3 to make available to the District and the District shall pay for the  
4 quantities of water specified in the schedule submitted by the District  
5 in accordance with Article 4: Provided, That the United States shall  
6 make available and the District shall pay for as a minimum the quantities  
7 set forth in the following table and that the United States shall not be  
8 obligated to furnish more than 75,000 acre-feet of water during any year  
9 of the term of this contract: And provided further, That if the District,  
10 prior to December 31, 1990, requests a decrease in the cumulative minimum  
11 quantities, such decrease shall be approved by the Contracting Officer  
12 within 12 months after receiving such request to the extent that other  
13 entities contract to buy the quantity in excess of the District's needs,  
14 or any portion thereof, at a rate of payment not less than that which the  
15 District is obligated to pay under this contract. The Contracting Officer  
16 will not refuse to contract with another entity willing and able to buy  
17 such quantity, or any portion thereof, at such a rate. Years shown refer  
18 to the years following the year of initial delivery date. The amount of  
19 revenue received in any year in excess of the payment for the cumulative  
20 minimum requirement in the following table for such year may be used in  
21 succeeding years to meet the payment for the cumulative minimum require-  
22 ment for water not actually used during such years. The amount of revenue  
23 received for water paid for within the cumulative minimum requirement for  
24 any year but not used during such year may be applied to meet the payment  
25 for any succeeding year to offset quantities used in excess of the  
26 cumulative minimum requirement for such year.

Table  
(in Acre-Feet)

<u>Year</u>	<u>Cumulative Minimum</u>	<u>Year</u>	<u>Cumulative Minimum</u>
1	1973 1,000	21	43 294,000 13
2	1974 9,000 80,000	22	44 309,000 13
3	75 24,000 110,000	23	45 324,000 13
4	76 39,000 150,000	24	46 339,000 13
5	77 54,000 150,000	25	47 354,000 13
6	78 69,000 150,000	26	1000 375,000 13
7	79 84,000 150,000	27	402,000 27
8	80 99,000 150,000	28	2000 435,000 33
9	81 114,000 150,000	29	474,000 27
10	82 129,000 150,000	30	519,000 13
11	83 144,000 150,000	31	570,000 13
12	84 159,000 150,000	32	627,000 13
13	85 174,000 150,000	33	2000 690,000 63
14	86 189,000 150,000	34	759,000 13
15	87 204,000 150,000	35	834,000 13
16	88 219,000 150,000	36	2000 909,000 13
17	89 234,000 150,000	37	984,000 75
18	90 249,000 150,000	38	1,059,000
19	91 264,000 150,000	39	1,134,000
20	92 279,000 150,000	40	1,209,000

1 (b) This contract shall not preclude the District from  
2 obtaining water from non-Project sources to satisfy its water supply  
3 needs: Provided, That the District shall not be relieved from its  
4 obligation to pay for the minimum quantities of water specified in  
5 subdivision (a) of this article.

6 (c) Pursuant to Contract No. 14-06-200-6497 between the  
7 United States and the City of Sacramento, and in accordance with the  
8 agreement of assignment of June 28, 1957, between the District and the  
9 City of Sacramento, the first 40 acre-feet of water furnished to the  
10 District during each day shall be deemed to be water which the District  
11 is allowed to divert under the agreement of assignment. Such diversions  
12 shall be considered to be part of the quantity of water which the  
13 District is obligated to pay for pursuant to this contract.

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(d) If at any time or times during the term of this contract the District determines that its water needs for the remainder of said term are for quantities different from those set forth in subdivision (a) of this article, by agreement the parties may decrease or, to the extent that water is available, as determined by the Contracting Officer, increase the quantities of water to be delivered by the United States. The Contracting Officer shall agree to any decrease in said quantities of water requested by the District if he can find a market for the balance of the water under terms and conditions satisfactory to him.

(e) If the District in any year requires a quantity of water in addition to the maximum quantity which the United States is obligated to furnish to the District, such additional water, if available, as determined by the Contracting Officer, may be furnished upon receipt from the District of a written request for such additional water together with a schedule indicating the desired times and quantities and payment for such water at the rate specified in Article 6. The furnishing by the United States and acceptance by the District of such additional water shall neither entitle nor obligate the District to receive such quantities in subsequent years.

WATER USE SCHEDULES

1  
2 4. For each year the District will submit a schedule showing  
3 the quantities of water required monthly. The first schedule for  
4 the balance of the then current year shall be submitted prior to  
5 the date on which the District wishes to take initial delivery of  
6 water hereunder. Thereafter, schedules for the succeeding years  
7 will be submitted no later than each November 1. All schedules  
8 shall be satisfactory in form to the Contracting Officer. The  
9 United States shall ~~attempt to~~ furnish said water in accordance with  
10 the aforesaid schedules or any revision satisfactory to the Contracting  
11 Officer, submitted by the District at least 15 days before the  
12 desired time for delivery or within such lesser period as the  
13 Contracting Officer shall determine to be reasonable.  
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1 the water to be delivered pursuant to the latest approved schedule  
2 during the second month immediately following. Water furnished in  
3 accordance with subdivision (e) of Article 3 shall be paid for in full  
4 at the time or times such requests are made. Adjustment for any  
5 difference between the payment for the scheduled amount of water and  
6 payment for the quantity of water actually delivered in any month,  
7 shall be made in the payment in the month immediately following:  
8 Provided, That the quantity of water paid for in any year shall not be  
9 less than the quantity necessary to fulfill the cumulative minimum  
10 quantity requirement for that year specified in subdivision (a) of  
11 Article 3, except as otherwise provided herein, and any additional  
12 payment required shall be made in December of that year: And provided  
13 further, That in the event the District is unable, fails, or refuses to  
14 accept delivery of the quantities of water available for delivery to it  
15 and which it is required to pay for pursuant to this contract, or in the  
16 event that the District in any year fails to submit a schedule as provided  
17 in Article 4, said inability, failure, or refusal shall not relieve the  
18 District of the obligation to pay for such water and the District agrees  
19 to make payment therefor in the same manner as if such water had been  
20 delivered and accepted by the District in accordance with this contract.

21  
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(b) Except for the first 40 acre-feet furnished  
2 to the District each day, the District shall pay a Delta service  
3 component at the rate of \$9 per acre-foot. On  
4 January 1, 1996, and at any time or times thereafter but not more than  
5 once in any 5-year period, the component may be adjusted so that it  
6 will provide revenues which, when added to the revenues from the  
7 component paid and anticipated to be paid over the Project repayment period,  
8 hereafter described in this article, by the District and by all  
9 other purchasers of Project water for municipal and industrial use  
10 who are subject to the Delta service component, will:

11 (1) Reimburse the United States for the portion of  
12 operation and maintenance costs properly allocable to municipal  
13 and industrial service of the Delta service facilities;

14 (2) Reimburse the United States for interest on  
15 the unpaid balance of the capital costs properly  
16 allocable to municipal and industrial service of the Delta  
17 service facilities which are existing or under construction;

18 (3) Reimburse the United States for the portion of  
19 the capital costs properly allocable to municipal and industrial  
20 service of the Delta service facilities which are existing or  
21 under construction; and

*by when?*

1 (4) Provide additional revenues not to exceed  
2 20% of the total amount of the revenues received and  
3 estimated to be received pursuant to subsections (1), (2), and  
4 (3) hereof, which additional revenues shall be credited against  
5 the costs of the Project properly allocable to agricultural use:  
6 Provided, however, That revenues shall not be so credited until  
7 after the interest referred to in subsection (2) and the capital  
8 costs referred to in subsection (3) hereof shall have been paid  
9 in full.

10 All funds received as the Delta service component shall be credited in  
11 the order and manner set forth above. Computations of adjustments of  
12 the component shall be on the basis that the Project repayment period  
13 began in 1941 and will continue for 50 years after completion  
14 of the last addition to the Project, and the interest rates shall be  
15 as determined by the Secretary at the time of each such addition, all  
16 pursuant to Project authorizing legislation. No adjustment shall  
17 increase or decrease the amount of the Delta service component by  
18 more than 20%. Before announcing an adjustment of  
19 the component, the Contracting Officer will make available to the  
20 District the date and computations upon which a proposed adjustment  
21 is based and will afford the District not less than 3 months  
22 to study and to comment thereon. Final determination of an adjustment  
23 will be announced by the Contracting Officer after consideration of  
24 the District's comments but not less than 6 months prior to the  
25 effective date thereof.

1 (c) In addition to the Delta service component pursuant  
2 to subdivision (b) hereof the District shall pay a Canal operation,  
3 maintenance, and replacement component of \$1 per acre-foot for all  
4 water furnished pursuant to this contract including the first 40 acre-  
5 feet each day, for the period ending the 5th fiscal year following  
6 that in which the initial delivery date occurs. Prior to June 15 of  
7 the last fiscal year of said period and June 15 of each succeeding  
8 5th fiscal year thereafter, the Canal operation, maintenance, and  
9 replacement component per acre-foot shall be redetermined by the  
10 Contracting Officer for the succeeding 5 fiscal years by dividing the  
11 estimated average annual operation, maintenance, and replacement costs  
12 of the Canal for that period, less the estimated incremental annual  
13 operation, maintenance, and replacement costs for said 5 fiscal years  
14 attributable to the East Side Division, by 600,000, or the total  
15 quantity of water that users of water from the Canal are obligated  
16 to pay for during the 5th fiscal year of the previous 5-fiscal-year  
17 period, whichever is the greater. When the water use during the 5th  
18 fiscal year of the preceding 5-fiscal-year period is less than  
19 600,000 acre-feet, the operation, maintenance, and replacement  
20 expenses may exceed the operation, maintenance, and replacement  
21 revenues. The deficit for each fiscal year shall be added to the

1 construction cost of the Canal. When the total water paid for  
2 during the 5th fiscal year of the preceding 5-fiscal-year period  
3 is greater than 600,000 acre-feet, and each 5th fiscal year  
4 thereafter, an adjustment will be made in the estimated cost in  
5 computing the component for the next 5-fiscal-year period to reflect  
6 the difference in the actual and estimated water use and the operation,  
7 maintenance, and replacement costs for the preceding 5 fiscal years.

8 (d) In addition to the foregoing components, the District  
9 shall pay a conveyance component which is intended to be fixed so as  
10 to repay the District's share of the capital cost of the Canal with  
11 interest on the unpaid balance at 3.225% per annum within the  
12 computation period. The conveyance component shall be \$6 per acre-  
13 foot for all water furnished pursuant to this contract including the  
14 first 40 acre-feet each day, for the period ending the 5th fiscal  
15 year following the fiscal year in which the initial delivery date  
16 occurs. Prior to June 15 of the last fiscal year of that period and  
17 June 15 of each succeeding 5th fiscal year thereafter, the Contracting  
18 Officer will redetermine the conveyance component for the succeeding  
19 5 fiscal years in accordance with the following:

20 (1) As used herein, the terms:

21

1           a. "capital cost" shall mean the total  
2 construction cost of the Canal, including the estimated  
3 cost of portions of the Canal yet to be constructed,  
4 plus the deficit in operation, maintenance, and replace-  
5 ment costs, as determined pursuant to subdivision (c)  
6 hereof, and interest during construction at the rate  
7 of 3.225% per annum, less the incremental portion of  
8 the aforesaid costs attributable to the East Side Division;

9           b. "computation period" shall mean a period  
10 commencing July 1 of the fiscal year following the fiscal  
11 year water is first available for delivery from the Canal  
12 and extending to June 30 of the 50th fiscal year after  
13 water is first available for delivery from the last major  
14 reach of the Canal;

15           c. "present worth" shall mean the sum of  
16 discounted annual quantities of water use at 3.225%  
17 per annum;

18           d. "District's total water use" shall mean  
19 either the annual quantities determined from subdivision (a)  
20 of Article 3 and 75,000 acre-feet or such smaller quantities  
21 provided for in the second proviso in subdivision (a) of  
22 Article 3 extended annually through the remainder  
23 of the computation period, or the District's  
24 past annual water quantities paid for plus its

1 estimated future deliveries projected through the  
2 computation period, whichever is the greater; and

3 e. "District's projected water use" shall mean  
4 that portion of the District's total water use which  
5 is to take place in the future, estimated as of the beginning  
6 of the period for which the conveyance component is redetermined;

7 (2) The District's share of the capital cost shall  
8 be determined each fiscal year by dividing the present worth,  
9 as of the beginning of the computation period, of the District's  
10 total water use by 14,364,000 (which is the present worth  
11 of the estimated deliveries of 36,168,000 acre-feet through  
12 the Canal during the computation period), and then multiplying  
13 this quotient by the capital cost;

14 (3) The amount of the District's unpaid balance  
15 shall be determined by the Contracting Officer as of June 30  
16 of each fiscal year, and shall be the District's share of  
17 the capital cost determined pursuant to subsection (2) hereof  
18 for said year, plus interest at 3.225% per annum charged on  
19 the amount of the District's unpaid balance, less the accumulated  
20 conveyance component revenues paid by the District prior to  
21 the date of determination: Provided, That no interest shall  
22 accrue on the unexpended portion of the capital cost; and

1 (4) The conveyance component will be redetermined  
2 by dividing the amount of the District's then current unpaid  
3 balance (as adjusted by discounting at 3.225% per annum to  
4 the beginning of the 5-year period those portions of capital  
5 cost estimated to be expended in the future) by the present  
6 worth, at the time of redetermination, of the District's projected  
7 water use.

8 RENEGOTIATION

9 7. If, hereafter, the United States enters into, renews, or  
10 amends any contract for municipal and industrial water from the  
11 Project which, because of a change in general Reclamation law or  
12 generally applicable policy, contains terms and conditions substantially  
13 more favorable with respect to (a) the Delta service component,  
14 or (b) other matters similar to those contained in this contract, the  
15 United States, upon the District's request, will renegotiate this  
16 contract for the purpose of providing comparable terms in accordance  
17 with the new law or policy.



POINT OF DELIVERY--DISTRICT FACILITIES--MEASUREMENT--  
RESPONSIBILITY FOR DISTRIBUTION OF WATER--MAINTENANCE OF  
FLows AND LEVELS--TEMPORARY REDUCTIONS

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3       9.   (a) The water to be furnished to the District pursuant to  
4 this contract will be delivered through a turnout from the Canal  
5 located at a point on the Canal approximately 700 feet upstream from  
6 the inlet transition of the Laguna Creek siphon. The capacity of the  
7 turnout will be not less than 170 cubic feet per second.

8               (b) The District will furnish the Contracting Officer  
9 drawings showing the construction to be performed by the District  
10 within the Canal right-of-way 6 months before starting said construction.  
11 The facilities may be installed, operated, and maintained on the  
12 Canal right-of-way subject to such restrictions and regulations  
13 as to type, location, method of installation, operation, and maintenance  
14 as may be prescribed by the Contracting Officer.

15               (c) All water delivered from the Canal shall be measured by  
16 the Contracting Officer with equipment furnished, operated, and  
17 maintained by the United States. The measuring equipment shall be  
18 installed by the District at its expense after submitting installation  
19 drawings to the Contracting Officer and obtaining his written approval  
20 thereto. All determinations relating to the measurement of such water  
21 shall be made by the Contracting Officer after consultation with the

1 District. Upon request of the District the accuracy of such measurements  
2 will be investigated by the Contracting Officer and any errors  
3 appearing therein will be adjusted.

4 (d) The United States shall not be responsible for the  
5 control, carriage, handling, use, disposal, or distribution of water  
6 beyond the facilities then being operated and maintained by the  
7 United States and the District shall hold the United States harmless  
8 on account of damage or claim of damage of any nature whatsoever  
9 for which there is legal responsibility, including property damage,  
10 personal injury, or death arising out of or connected with the  
11 control, carriage, handling, use, disposal, or distribution of  
12 water beyond such facilities.

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1           (e) The United States shall make all reasonable efforts,  
2 consistent with the overall operation of the Project, to maintain  
3 sufficient flows and levels of water in the Canal to furnish water  
4 to the District at the full designed capacity of the turnout  
5 established as the delivery point pursuant to this article.

6           (f) The United States may temporarily discontinue or  
7 reduce the quantity of water to be furnished to the District as herein  
8 provided for the purposes of investigation, inspection, maintenance,  
9 repair, or replacement of any of the Project facilities or any part  
10 thereof necessary for the furnishing of water to the District, but  
11 so far as feasible the United States will give the District due  
12 notice in advance of such temporary discontinuance or reduction, except  
13 in case of emergency, in which case no notice need be given: Provided,  
14 however, That the United States shall use its best efforts to avoid any  
15 discontinuance or reduction in service for a period longer than 3  
16 days. In the event of any such discontinuance or reduction, upon  
17 resumption of service and if requested by the District the United States  
18 will attempt to deliver the quantity of water which would have been  
19 furnished hereunder in the absence of such contingency.

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WATER SHORTAGE AND APPORTIONMENT

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2       10. In its operation of the Project the United States will  
3 use all reasonable means to guard against a condition of shortage  
4 in the quantity of water available to the District pursuant to  
5 this contract. If, nevertheless, a shortage does occur during  
6 any year on account of drought, errors in operation, or other causes  
7 which, in the opinion of the Contracting Officer, are beyond his  
8 control, in no event shall any liability accrue against the United  
9 States or any of its officers, agents, or employees for any damage,  
10 direct or indirect, arising therefrom. In a year in which the  
11 Contracting Officer determines that there is a shortage in the  
12 quantity of water available to customers of the United States from  
13 the Project, the Contracting Officer will apportion the available  
14 water among the water users capable of receiving water from the  
15 same Project water supply in such manner as he deems equitable  
16 and physically possible, subject to the following limitation:  
17 The quantities to water users receiving municipal and industrial  
18 water service shall not be reduced until the reduction assigned  
19 to agricultural water users amounts to 25% of the agricultural  
20 contractual commitments for that year. In the event further reductions  
21 are necessary, the supplies for both municipal and industrial and

1 agricultural users shall be reduced by the same percentages:  
2 Provided, That the foregoing shall not affect the obligations of  
3 the United States under contracts entered into prior to the date of  
4 this contract, or under water rights settlements.

5 QUALITY OF WATER

6 11. The operation and maintenance of Project facilities and  
7 the design and construction of new Project facilities for the pro-  
8 vision of Project water under this contract shall be performed in  
9 such a manner as to maintain the quality of raw water to be delivered  
10 hereunder at the highest level reasonably attainable as determined  
11 by the Contracting Officer. The United States is under no obligation  
12 to construct or furnish water treatment facilities to maintain or to  
13 better the quality of water. Further, the United States does not  
14 warrant the quality of water to be furnished pursuant to this  
15 contract.

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AIR POLLUTION CONTROL

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2           13. The District agrees that within its legal authority  
3 it will comply fully with all Federal laws, orders, and regulations,  
4 and with all laws of the State of California, all as administered  
5 by appropriate authorities, concerning the pollution of the air  
6 with respect to radioactive materials or other pollutants and  
7 applicable to the facilities at which the District makes use of  
8 the water delivered pursuant to this contract.

9           BENEFITS CONDITIONED UPON PAYMENT--GENERAL OBLIGATION

10           14. (a) The payment of charges becoming due hereunder is  
11 a condition precedent to receiving benefits under this contract.

12                   (b) The District will cause to be levied and collected  
13 all necessary assessments, tolls, and other charges, and will  
14 use all of its authority and resources to meet the obligations  
15 hereunder. The obligation of the District to pay to the United  
16 States the charges becoming due as provided herein is a general  
17 obligation of the District, notwithstanding the manner in which  
18 the obligation may be distributed among the District's customers  
19 and notwithstanding the default of individual power users of assessments,  
20 tolls, or other charges levied by the District.





1                   CONTINGENT ON APPROPRIATION OR ALLOTMENT OF FUNDS

2           19. The expenditure or advance of any money or the performance  
3 of any work by the United States hereunder which may require appropriation  
4 of money by the Congress or the allotment of funds shall be contingent  
5 upon such appropriation or allotment being made. The failure  
6 of the Congress to appropriate funds or the absence of any allotment  
7 of funds shall not relieve the District from any obligations under  
8 this contract. No liability shall accrue to the United States  
9 in case such funds are not appropriated or allotted.

10                   OFFICIALS NOT TO BENEFIT

11           20. (a) No Member of or Delegate to Congress or Resident  
12 Commissioner shall be admitted to any share or part of this contract  
13 or to any benefit that may arise herefrom. This restriction shall  
14 not be construed to extend to this contract if made with a corporation  
15 or company for its general benefit.

16                   (b) No official of the District shall receive any benefit  
17 that may arise by reason of this contract other than as a resident  
18 within the District and in the same manner as other residents  
19 within the District.



DETERMINATIONS

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23. (a) Where the terms of this contract provide for action to be based upon the opinion or determination of either party to this contract, whether or not stated to be conclusive, said terms shall not be construed as permitting such action to be predicated upon arbitrary, capricious, or unreasonable opinions or determinations.

(b) In the event the District questions any factual determination made by any representative of the Secretary as required in the administration of this contract, any findings as to the facts in dispute thereafter made by the Secretary shall be made only after consultation with the District.

(c) Except as otherwise provided herein, the Secretary's decision on all questions of fact arising under this contract shall be conclusive and binding upon the parties hereto.



1 (c) The District will send to each labor union or  
2 representative of workers with which it has a collective  
3 bargaining agreement or other contract or understanding, a  
4 notice, to be provided by the Contracting Officer,  
5 advising the labor union or workers' representative of the  
6 District's commitments under this Equal Opportunity clause,  
7 and shall post copies of the notice in conspicuous places  
8 available to employees and applicants for employment.

9 (d) The District will comply with all provisions of  
10 Executive Order No. 11246 of September 24, 1965, as amended,  
11 and of the rules, regulations, and relevant orders of the  
12 Secretary of Labor.

13 (e) The District will furnish all information and reports  
14 required by Executive Order No. 11246 and by the rules, regulations,  
15 and orders of the Secretary of Labor, or pursuant thereto, and  
16 will permit access to its books, records, and accounts by the  
17 Contracting Officer and the Secretary of Labor for purposes of  
18 investigation to ascertain compliance with such rules, regulations,  
19 and orders.  
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1 (f) In the event of the District's noncompliance with  
2 the Equal Opportunity clause of this contract or with any  
3 of the said rules, regulations, or orders, this contract may  
4 be canceled, terminated, or suspended, in whole or in part,  
5 and the District may be declared ineligible for further Government  
6 contracts in accordance with procedures authorized in  
7 Executive Order No. 11246, and such other sanctions may be imposed and  
8 remedies invoked as provided in said Executive Order, or by  
9 rule, regulation, or order of the Secretary of Labor, or as  
10 otherwise provided by law.

11 (g) The District will include the provisions of sub-  
12 divisions (a) through (r) in every subcontract or purchase order  
13 unless exempted by rules, regulations, or orders of the Secretary  
14 of Labor issued pursuant to Section 204 of Executive Order No. 11246,  
15 so that such provisions will be binding upon each subcontractor  
16 or vendor. The District will take such action with respect to  
17 any subcontract or purchase order as the Contracting Officer may  
18 direct as a means of enforcing such provisions, including  
19 sanctions for noncompliance: Provided, however, That in the  
20 event the District becomes involved in, or is threatened with,  
21 litigation with a subcontractor or vendor as a result of such  
22 direction by the Contracting Officer, the District may request  
23 the United States to enter into such litigation to protect the  
24 interests of the United States.

RESOLUTION NO. 6614

BE IT RESOLVED BY THE BOARD OF DIRECTORS  
OF SACRAMENTO MUNICIPAL UTILITY DISTRICT:

Section 1. The President is authorized and directed to execute, and the Secretary to attest, a contract with the United States of America providing for water service, such contract to be identical in form to that attached to the original of this resolution and designated R.O. Draft 9/19-1970, Contract No. 14-06-200-5198A.

Adopted November 19, 1970

I hereby certify that the foregoing is a correct copy of a resolution adopted by the Board of Directors of Sacramento Municipal Utility District,

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David S. Kaplan  
Secretary