
Testimony for the Application for Certification for the Cosumnes Power Plant 01-AFC-19

Group 2:
Alternatives and Biological Resources

Submitted to the
California Energy Commission

May 5, 2003

Submitted by
SACRAMENTO MUNICIPAL UTILITY DISTRICT



2485 Natomas Park Drive
Sacramento, California 95833

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APPENDIX A: Resumes

Alternatives: Including project site alternatives, pipeline alignment alternatives, and laydown area alternatives

I. Introduction

A. Name

Kevin M. Hudson, P.E. and Colin Taylor

Our qualifications are summarized in the attached resumes (Appendix A).

B. Prior Filings

The following specific filings for Alternatives were prepared by us, or under our direction or supervision:

- € Application for Certification Section 9.0 and Sections 6.1 through 6.3
- € Application for Certification Data Adequacy Supplement
- € AFC Supplement A
- € AFC Supplement B
- € AFC Supplement C
- € AFC Supplement D
- € Data Responses, Set 1A, No. 6
- € Data Responses, Set 3A, No. 243
- € Informal Data Response Set 2, No. W&SR-8
- € Kathy Peasha Data Response Set 2, Nos. PD-1 and PD-2

To the best of my knowledge, all of the facts contained in this testimony (including all referenced documents) are true and correct. I make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary

The overall project objective is to restore the electric generating capacity tying into the Rancho Seco switchyard in order to provide additional generation and critically needed voltage support using existing or nearby critical infrastructure including the water conveyance and storage facilities, the transmission lines with unused capacity by constructing a gas generating facility to serve impending electricity load needs from within the SMUD service area.

We have reviewed Staff's Alternatives analysis as set forth in the FSA and find it acceptable. We agree with the conclusions reached by CEC Staff that no project alternative will achieve this objective and reduce project impacts. Furthermore, although the no project alternative will reduce impacts it will not achieve the project objective. The overall project design and implementation of the Conditions of Certification will ensure the following:

1. That the facility will be designed, sited, and operated in compliance with applicable public health and safety standards, applicable air and water quality standards, and any other federal, state, regional and local laws, ordinances, regulations, and standards (LORS);
2. That the facility will be designed, sited and operated to protect environmental quality and assure safe and reliable operation of the facility; and to ensure that any potential environmental impacts will be avoided or mitigated to a level of insignificance.

Plant Location Selection

The plant location selection is detailed in AFC Section 9.0, where SMUD evaluated a number of possible locations for a 1,000-MW power plant built in two phases. An additional consideration is that critically needed voltage support is required directly within the SMUD service area. Using the existing switchyard at Rancho Seco, appropriately sized water conveyance and storage facilities and transmission lines with unused capacity by constructing a generating facility at Rancho Seco will serve impending electricity load needs from within the SMUD service area. The CPP location at Rancho Seco was the overwhelming best choice for a power plant site.

Plant Site Selection Within Rancho Seco Property

In determining the appropriate site within the 2,480-acre Rancho Seco property, SMUD considered all of the siting criteria used by the CEC, and also took into account additional restrictions and criteria specific to SMUD and the surrounding community (see Data Response Set 1A, # 6). The criteria led to the best overall placement of the site in close proximity to existing infrastructure, while minimizing impact to the environment, the local community, and the public using Rancho Seco Park. A primary consideration unique to the project was worker and public safety to minimize interference with decommissioning activities and keeping the plant a safe distance from spent nuclear fuel storage area. Also important was minimizing impacts to other generating capabilities on the property such as the photovoltaic facility, and to allow for any desired future expansion of that facility.

Laydown Area Selection

Two laydown areas were originally proposed for CPP. One located to the west of the plant site and one to the south. SMUD chose the area that met the best overall choice by considering a number of criteria, including least impact to biology, soils, visual impact to surrounding community (line of sight and construction noise), and proximity to neighboring properties. A portion of the south laydown area drains toward the plant and into the detention basin, which precludes the possibility of digging another retention basin if the west site was chosen. In addition, the following were considered in selecting laydown area alternatives.

1. A laydown area close to the site affords greater safety to employees and public, by lessening travel time and traffic on Clay East Road and Rancho Seco Park road periodically throughout the day for the retrieval of supplies and equipment.
2. Remote parking has been suggested by others as an alternative to parking on site or at the laydown area. Remote parking would add cost, increase an employees workday, lower safety, morale, and productivity; thus, increasing community impact by lengthening the construction schedule.
3. Minimize biological impacts: comparing laydown areas south and west of the CPP plant site, the south laydown had slightly fewer overall impacts, all of which are mitigable.
4. The laydown area was chosen to minimize cost of equipment and materials retrieval.
5. It is likely that the Rancho Seco Plant industrial area would be used for select, larger pieces of equipment shipped by rail; therefore, SMUD is using existing paved areas on Rancho Seco property where practical and safe.

Pipeline Alternatives

The selection of pipeline alternatives is summarized in AFC Section 6. Several routes were considered, and then further narrowed to a proposed route meeting numerous criteria. The selection of the proposed route used the principal of least environmental impact for greatest public good. As engineering progressed, the pipeline alignment underwent further micro-adjustments to address ongoing biological and cultural studies, and other information gathered by survey crews.

III. Declaration

I, Kevin M. Hudson, P.E., declare as follows:

1. I am presently employed by SMUD as a Senior Project Manager.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I supervised the preparation of testimony in all disciplines for the Cosumnes Power Plant based on my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.
5. In my opinion, I am personally familiar with the general facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 5, 2003

Signed: _____

At: Sacramento, CA

III. Declaration

I, Colin Taylor declare as follows:

1. I am presently employed by SMUD as CPP Project Director.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I supervised the preparation of testimony in all disciplines for the Cosumnes Power Plant based on my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.
5. In my opinion, I am personally familiar with the general facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 5, 2003

Signed: _____

At: Sacramento, CA

Alternatives

I. Introduction

A. Name

Susan Strachan

B. Purpose

This testimony addresses the shuttling of construction employees to and from the project site at the El Segundo Power Redevelopment Project and the comparison of that project to the Cosumnes Power Plant Project.

C. Qualifications

Susan Strachan is an independent consultant, providing environmental project management services. She has 18 years of environmental regulatory experience, 11 of which have specifically dealt with energy projects before the California Energy Commission. Her qualifications are summarized more completely in the attached resume (Appendix A).

II. Summary

The El Segundo Power Redevelopment Project is located in El Segundo, California. The project is on an existing power plant site. There is limited space available on-site or on land adjacent to the site for construction laydown and construction worker parking because the surrounding area has been fully developed. Specifically, it is bordered by Vista Del Mar Blvd. and the Chevron Refinery on the east, Santa Monica Bay to the west, a residential area of the City of Manhattan Beach to the south, and the Chevron Marine Terminal to the north. The project has a projected peak construction workforce of 422.

I spoke with John McKinsey, an attorney with Livingston & Mattesich, representing the El Segundo Power Redevelopment Project applicant. He stated that off-site construction parking and the shuttling of construction workers was necessary for the El Segundo Project because there is not adequate space available on-site to accommodate all of the construction workers. The El Segundo site totals 32.8 acres.

In comparison, the Cosumnes Power plant project will be located on 30 acres, within the 2,480-acre Rancho Seco site, owned by the Sacramento Municipal Utility District. With the exception of the land used by the decommissioned Rancho Seco Nuclear Power Plant, Photovoltaic Generation Area, a leased farm, and Rancho Seco Park, the remaining acreages are generally undeveloped. After taking into consideration the environmental constraints on the vacant land, there is ample space adjacent to the project site for construction laydown and parking. Moreover, SMUD is fully mitigating the impacts of using the laydown/parking area, even though the impacts are temporary and portions of the site may be restored to their original condition.

Declaration

I, Susan Strachan, declare as follows:

6. I am presently a consultant to SMUD on the Cosumnes Power Plant project.
7. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
8. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed herein.
9. In my opinion, I am personally familiar with the general facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 5, 2003

Signed: _____

At: Davis, CA

Biological Resources

I. Introduction

A. Name

EJ Koford, MS, Certified Wildlife Biologist. Mr. Koford has over 20 years experience in biological resource evaluation and analysis issues. He has conducted 21 biological resources investigations for power plants and electrical energy transmission projects. His resume is attached (Appendix A).

B. Prior Filings

This testimony includes by reference to the following documents submitted in this proceeding that are listed in Appendix B, which were prepared under my direction or supervision.

- € Section 8.2 of the AFC
- € Data Adequacy Supplements A through D to the AFC
- € Data Response, Set 1A Nos. 8, 10, 11, 13 – 15, 17, 21, 23 - 28
- € Data Response, Set 1B No. 9
- € Data Response, Set 1C Nos. 7, 12, 17, and 18
- € Data Response, Set 1E
- € Data Response, Set 1G No. 16
- € Data Response, Set 1H Nos. 19, 20, 25, 29, and 31
- € Data Response, Set 1I No. 22
- € Data Response, Set 1J No. 30
- € Data Response, Set 1O No. 22
- € Data Response, Set 3A Nos. 189 – 200, and 204 - 207
- € Data Response, Set 3B Nos. 186, 187, 190, 197, 198, 200, 201, 203, 206, and 207
- € Data Response, Set 3C No. 206
- € Data Response, Set 3D Nos. 188, 191, 201, 202, 204, 206, and 207
- € Data Response, Set 3E No. 195
- € Data Response, Set 3F No. 195
- € Data Response, Set 3G No. 201
- € Data Response, Set 3I No. 201
- € Data Response, Set 3J No. 201 and 206
- € Data Response, Set 3M Nos. 186 and 187
- € Data Response, Set 3O No. 201
- € Data Response, Set 3P No. 201
- € Data Response, Set 3Q No. 201
- € Data Response, Set 3R No. 201
- € Informal Data Response Set 2 Nos. BIO-1 through BIO-6
- € Informal Data Response Set 3 No. BIO-8

- € Informal Data Response Set 4 No. BIO-9
- € Informal Data Response Set 5 No. BIO-10
- € Informal Data Response Set 15
- € Peasha Data Response Set 2 No. T&T-4

To the best of my knowledge, all of the facts contained in this testimony (including all referenced documents) are true and correct. I make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary

The Final Staff Assessment (FSA) for the Cosumnes Power Plant (CPP) project recommends that Conditions of Certification be adopted to address Biological Resources. These conditions are BIO-1 through BIO-22 and are described on pages 4.2-46 through 4.2-57 of the FSA. Implementation of the Conditions of Certification will ensure that the facility will be in compliance with the applicable federal, state, and local laws, ordinances, regulations, and standards (LORS) and any potential impacts will be mitigated to a level of insignificance. I have reviewed the Staff's proposed Conditions of Certification set forth in the FSA and find them acceptable.

Project Overview and Methods of Analysis

The Sacramento Municipal Utility District (SMUD) proposes to develop a 1,000-megawatt (MW) natural gas-fired power plant (CPP) and 26-mile natural gas pipeline in southern Sacramento County. The purpose of Chapter 8.2 of the AFC and subsequent data is to review the proposed CPP in sufficient detail to determine to what extent the proposed action may cause impacts as described in CEQA, or may affect any of the threatened, endangered, proposed, or sensitive species; or critical habitat.

The Biological Resources Analysis consisted of: 1) an evaluation of existing records, reports and databases including the CNDDDB; 2) consultation with agencies responsible for protection of sensitive biological resources; 3) Field surveys to confirm and supplement information from these sources; 4) public and agency review of the biological analysis presented in the AFC and responses; and 5) application for and fulfilling compliance requirements for individual permits from each of state and federal agencies.

Other permits and evaluations that were prepared or will be required for biological resources for this project include:

- 1) ACOE Section 404 Permit application for wetland fill, submitted to the U. S. Army Corps of Engineers on April 23, 2003.
- 2) USFWS Biological Assessment, prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (16 U.S.C. 1536(c); 50 CFR 40214). The U.S. Army Corps of Engineers is the lead federal agency for the proposed project and will oversee compliance with federal laws, ordinances, regulations, and standards (LORS) for the project, as well as any mitigation and

protection measures for sensitive biological resources. Submitted to the USFWS and docketed on April 4, 2003

- 3) RWQCB Section 401 Permit application for water quality certification, submitted to the RWQCB on April 30, 2003.
- 4) CDFG Section 1600 Permit application for Streambed Alteration, submitted to CDFG on September 12, 2002 (Data Response Set 3I).
- 5) CDFG Section 2081 Permit application for Incidental Take of State-listed species submitted to CDFG April 7, 2003
- 6) Sacramento County Heritage Tree Permit application, submitted December 31, 2001 (Data Response Set 3M).
- 7) RWQCB NPDES permit for stormwater discharges during construction, submit 60 days prior to construction.

The AFC presents a detailed description of the project and addresses potential project impacts to sensitive biological resources in the project area. The BA further refines the analysis of impacts to special-status species that occur, or could potentially occur, in the CPP project area. The BA also addresses state-listed species as it may be used during consultation with the California Department of Fish and Game (CDFG) under Fish and Game Code Section 2081.

Project Location and Description of Proposed Action

The project would be located on a 30-acre parcel about 1,500 feet south of the existing non-operational Rancho Seco Plant (Rancho Seco or RSP) on a portion of a 2,480-acre site owned by SMUD. This location will allow the reuse of existing water systems, switchyards, and transmission lines that are already in place at Rancho Seco. The project is at 150 feet elevation, at the base of the foothills that rise to the Sierra Nevada east of the project. The 0.3-mile water supply line and 0.4-mile electrical transmission line connecting to existing RSP features and the CPP site are in the same location and habitat as the project site. Construction of the interconnecting buried water supply line is a temporary disturbance. Stringing the transmission lines would be a temporary disturbance, while the transmission tower footings would be a permanent feature. There would be a temporary, 20-acre construction laydown area just south of the project site. Use of this area would require changing portions of two ephemeral drainages to go around the laydown area and to align with the drainages north of Clay East Road. The construction access road to be built on SMUD-owned property may or may not be a permanent feature. The site is located on the Goose Creek quadrangle, United States Geological Survey (USGS) at Section 29, Township 6N, Range 8E.

Power Plant and Construction Laydown Area

CPP will consist of a nominal 1,000-megawatt (MW) combined-cycle natural gas-fired power plant. The plant will be constructed in two phases, each consisting of 500 MWs. Each phase will have two combustion turbines, one condensing steam turbine, and two heat recovery steam generators (HRSGs). Construction of CPP will require that 30 acres of annual grassland be leveled and elevated for the CPP footprint and an electrical switchyard. A construction access road will be built, which will be used for access to the plant during

construction. Preparation of the site requires permanent changes of two intermittent swales. The swales currently run from south to north through the center of the site, primarily flow only during the rainy season. The east swale will be realigned further to the east and north side of the site, where meandering flow will join with Clay Creek to the north of the site. The west swale will meander through the switchyard and be captured in an onsite sediment detention basin before discharge. Swales in the laydown area would be realigned slightly to match with the swales circumventing the power plant site.

Gas Pipeline

Natural gas for the facility will be delivered via a new 24-inch-diameter pipeline extending 26 miles from SMUD's existing transmission backbone pipeline network that currently terminates at the Carson Ice-Gen Facility in Elk Grove. The new gas pipeline crosses several roadways and is adjacent to railroad rights-of-way in the south County, crosses under several foothill streams and irrigation ditches typical of the Sacramento Valley, and then lies adjacent to the road right-of-way (ROW) along Twin Cities Road and Clay East Road, in predominantly hay fields, alfalfa fields, and vineyards.

Construction of the natural gas pipeline would require three construction methods, the conventional open-cut trench method, horizontal directional drill (HDD), and jack-and-bore.

Associated Project Features

The following additional features will be part of the CPP project:

- € A stormwater detention basin and discharge outfall structure to Clay Creek will be located in the northwest corner of the CPP site. The outfall from the basin would be designed to incorporate measures to reduce contaminants, consistent with stormwater requirements, and with a flow dissipater structure or equivalent to reduce velocity and potential scouring from the outfall.
- € New triple circuit 0.4-mile long 230-kV transmission lines will extend north northeast from the proposed switchyard at the CPP site to the existing Rancho Seco Plant's 230-kV switchyard. Approximately 6 new steel pole transmission towers would be required.
- € An existing 66-inch diameter buried pipeline conveys water from Folsom-South Canal (FSC) to the Rancho Seco Plant. Water for cooling CPP will be supplied by a new 0.4-mile 20-inch diameter pipeline connection to the existing water facilities at Rancho Seco. FSC diverts water from the American River at Lake Natoma. Phase 1 of the plant would use approximately 220 acre-feet per month, or 1,719 gpm or 3.7 cubic feet per second. Phase 2 of the plant would use approximately 220 acre-feet per month or 1,719 gpm, or 3.7 cubic feet per second. The water pipeline connection will require a 65-foot-wide construction corridor resulting in temporary disturbance to 1.3 acres of pasture, annual grassland, and seasonal swales.
- € A Zero-liquid Discharge (ZLD) system will process all of the cooling water produced by the plant, returning a relatively high quality distillate stream for reuse in the plant and producing a solids waste stream suitable for disposal in a landfill.
- € Domestic water and process makeup water will be supplied by diverting a portion of the cooling water from the Folsom-South Canal to a package treatment plant.

- € A temporary 20-acre construction laydown area would be located in annual grassland immediately south of the CPP site, on the south side of Clay East Road. Two swales, an east and a west swale, currently run through the portion of land selected for the laydown area. The laydown area will be arranged in a polygon shape to minimize alteration of the swales, except where the northward flow approaches Clay East Road. Here, the earth will be graded to direct flow toward a new culvert system that directs natural drainage under Clay East Road and around the plant site. The laydown area will be revegetated to annual grassland after construction is complete.

Consultation and Coordination with Agencies

SMUD initiated informal consultations with the USFWS, CDFG, NMFS, and ACOE beginning on March 7, 2001. From the initiation of this project SMUD provided current project description information, pipeline alignments, proposals for surveys and mitigation and solicited the assistance, advice and participation of those agencies in developing and designing a project that would meet the objectives of SMUD to deliver safe, clean, reliable power to its customer-owners, while avoiding, minimizing or compensating for adverse environmental affects that might occur.

Over the next 24 months, SMUD and their consultants and attorneys corresponded by telephone, email, met with and performed field visits with these agencies more than 30 times to arrive at the agreements for project monitoring and mitigation that have been incorporated into the project. SMUD has worked diligently to identify and apply objective science and published and reviewed criteria to the objective determination of impacts and to present mitigation. SMUD has submitted this information to the agencies for review and implemented revisions and modifications at their request throughout.

Impacts and Mitigation

Table 2 summarizes the area of major project features and durations of impact.

TABLE 2
Total Area in Acres of Temporary and Permanent Surface Disturbance During Construction and Operation of CPP

Feature	Size of Disturbance	Duration (if temporary)	Habitat Type	Temporary (acres)	Permanent (acres)
Project Site and Detention Basin	Polygon of CPP site and detention basin		Annual Grassland with open water, streams, seasonal marsh, swales, wetlands, and vernal pools	NA	30
Site Construction Laydown	Polygon	32 months	Annual Grassland with seasonal stream and swale, and vernal pools	20	0.62
Site Construction Access Road	0.5 mile x 24' wide permanent, additional 0.5 mile x 25' for construction	12 months	Annual grasslands and wetland swales	1.5	1.5
Gas Pipeline	Polygons for construction corridor over 26 miles (encompasses 26 miles x 35' permanent easement [(26 x 5280 x 35)/43560 = 110 acre easement])	22 month	Ruderal, roadside, agricultural, annual grassland, along with jurisdictional wetlands including marsh, seasonal swales, wetlands, vernal pools, ditches, and ponded features. HDD drilling beneath river, creek, and riparian woodland habitats.	212	0
Gas Valving Stations	Two sites 50 x 50, one site 100 x 100		Ruderal, roadside, annual grassland, agricultural		0.34
Gas Pipeline Gas Compressor Stations	Two sites of 150' x 150' contained in existing fenced/ disturbed areas.		Fenced gravel area at existing interconnection		0
230-kV Transmission Line	Corridor 0.4 mile suspended lines, 150' wide temporary construction corridor	8 weeks	Annual grassland with seasonal swales and creek and degraded vernal pools	7.3	
Transmission Tower Footprints	Six towers with 6' in diameter, permanent concrete footings.		Annual grassland		0.004
Water Supply	0.4 mile x 75' temporary construction width.	4 weeks	Annual grassland with seasonal swales and creek and degraded vernal pools	3.7	0
Water Pump Station	(existing)				0
Total				244.5	32.46

Mitigation Measures to Reduce Impacts

The construction and operation of CPP would cause impacts to lands currently used for rural residential and agriculture use in the project area. However, because these areas have generally been altered from natural conditions some basic measures to avoid and minimize adverse impacts are appropriate as described below.

- € Provide worker environmental awareness training for all construction personnel that identifies the sensitive biological resources and measures required to minimize 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 Implementation and Monitoring Plan (BRMIMP) that outlines how the Project Owner will implement the mitigation measures.
- € 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.
- € Prepare construction monitoring and compliance reports that analyze the effectiveness of the mitigation measures.

Compliance with Laws, Ordinances, Regulations, and Standards

The Project Owner will comply with laws, ordinances, regulations, and standards by completing preconstruction surveys for biological resources and monitoring during earth disturbing activities and complying with all permit conditions.

With the implementation of the above mitigation measures, in combination with the proposed Conditions of Certification contained in the FSA, the project will comply with the applicable federal, state, and local laws, ordinances, regulations, and standards, and potential impacts, if any, will be mitigated to a level of less than significant.

III. Declaration

I, EJ Koford, , declare as follows:

1. I am presently employed by IEC Corporation as a as a Senior Biologist and Project Manager.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I supervised the preparation of testimony in all disciplines for the Cosumnes Power Plant based on my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.
5. In my opinion, I am personally familiar with the general facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 5, 2003 Signed: _____

At: Sacramento, CA

Biological Resources

I. Introduction

A. Name

Debra Crowe

My qualifications are summarized in the attached resume (Appendix A)

B. Prior Filings

This testimony includes by reference the following Biological Resources documents submitted in this proceeding:

- € Biological Resources Mitigation Implementation and Monitoring Plan for the Cosumnes Power Plant, Sacramento County, California (BIO-5)
- € Memorandum titled "SMUD Cosumnes Power Plant Project Condition of Certification BIO-18: Preconstruction Surveys for Nesting Burrowing Owl, Swainson's Hawk, Raptors and Songbirds, April 2003" (Attachment 1).
- € Cosumnes Power Plant Pipeline Project 2003 Aquatic Amphibian and Reptile Surveys, Prepared by Mark Jennings, Rana Resources, May 4, 2003 (Attachment 2).

To the best of my knowledge, all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary

The Final Staff Assessment (FSA) for the Cosumnes Power Plant (CPP) project recommends that Conditions of Certification be adopted to address Biological Resources. These conditions are BIO-1 through BIO-22 and are described on pages 4.2-46 through 4.2-57 of the FSA. Condition of Certification BIO-5 requires the preparation and implementation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). BIO-18 addresses surveys for California tiger salamander breeding habitat, nesting Swainson's hawks, burrowing owls, and nesting birds required by SMUD prior to construction.

Project design and implementation of the Conditions of Certification will ensure that the facility will be in compliance with the applicable federal, state, and local laws, ordinances, regulations, and standards (LORS) and any potential impacts will be mitigated to a level of insignificance. I have reviewed the Staff's proposed Conditions of Certification set forth in the FSA and Addendum and find them acceptable.

The location of the proposed CPP is on a 30-acre parcel south of the existing non-operational Rancho Seco Plant on a portion of land owned by SMUD. This location will allow the reuse

of existing water systems, switchyard, and transmission lines that are already in place at Rancho Seco on SMUD property, thereby reducing impacts to biological resources in the Central Valley from longer linear features. The laydown area south of the CPP site was chosen due to a slightly favorable biological review compared to other potential laydown area locations adjacent to the CPP site, in conjunction with more favorable results from a cost, safety, noise, and visual environmental analysis.

Consultation and Coordination with Agencies

SMUD initiated informal and formal consultations with federal and state agencies responsible for protection of special-status species that could be affected by construction and operation of the CPP. The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) are responsible for the species listed under the Federal Endangered Species Act (ESA). Consultation with USFWS was conducted for the threatened giant garter snake (*Thamnophis gigas*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), endangered vernal pool tadpole shrimp (*Lepidurus packardii*), and migratory birds. The CDFG is responsible for state-listed and species of special concern. Consultation with CDFG was conducted for the threatened Swainson's hawk (*Buteo swainsoni*) and joint listed species such as giant garter snake. The NMFS is responsible for protection of listed chinook salmon and Central Valley steelhead in the rivers.

During the informal consultation process, SMUD worked with the agencies to analyze the project designs to determine if there were ways to avoid and minimize impacts to special-status species with design modifications and still allow efficient operation of CPP to meet the electricity goals of California. Modifications identified to be feasible and provided additional avoidance and minimization of impacts to special-status species included:

- € Choosing the site location to be on public/quasi-public Ag-80 zoned Rancho Seco property with available water, transmission line access that reduces impacts from longer linear features.
- € Using Zero Liquid Discharge (ZLD) for discharging process water, eliminating contaminants to Clay Creek and the Cosumnes River watershed.
- € Reducing the size of laydown area to avoid realigning portions of the intermittent swales occurring there.
- € Using HDD technology to place the gas pipeline under rivers, creeks, and drainages that support listed species such as chinook salmon (*Oncorhynchus tshawytscha*), Central Valley steelhead (*Oncorhynchus mykiss*), giant garter snake (*Thamnophis gigas*), Western pond turtle (*Clemmys marmorata marmorata*), Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) habitat, and bats that roost in riparian trees.
- € Realigning portions of the gas pipeline to avoid the Laguna Stone Lake Mitigation Area.

During informal and formal consultation, specific mitigation measures were identified to compensate for unavoidable loss of habitat used by special-status species and impacts during construction and operation. These mitigation measures include:

- € Provide habitat preservation and creation in a USFWS approved mitigation bank for the direct loss of 2.967 acres and indirect disturbance to 6.877 acres of ponding habitats

potentially inhabited by vernal pool fairy shrimp and vernal pool tadpole shrimp on the site and along the gas pipeline. The compensatory habitat replacement ratio is 3:1 for direct impacts and 2:1 for indirect impacts, resulting in 19.7 acres of vernal pool habitat that will be preserved and 3.0 acres that will be created in a USFWS approved mitigation bank or other approved location for a total of 22.7 acres of compensatory habitat.

- € Provide vernal pool habitat compensation in a mitigation bank that also supports California tiger salamander. Although, no breeding habitat for California tiger salamander would be affected, a breeding pond was identified within 0.75 miles of the site during April 2003 surveys. Individual salamanders could be affected during construction on the CPP site since migrating salamander could use burrows in the area for shelter during the dry season. Habitat compensation for vernal pools will also compensate for the CTS.
- € Provide habitat preservation in a USFWS and CDFG approved mitigation bank for the indirect affects to 41.5 acres of giant garter snake habitat along the gas pipeline. The compensatory habitat replacement ratio is 1:1 for indirect impacts. Additional protection measures for giant garter snake include construction in habitat during the active season from May 1 to October 1 when snakes are active.
- € Provide habitat preservation in a CDFG approved mitigation bank for the direct loss of 53.9 acres of suitable habitat for foraging Swainson's hawk at the CPP site and laydown area. The compensatory habitat replacement ratio is 1:1 for impacts to foraging habitat. Swainson's hawks nest in trees along the Cosumnes River, Laguna Creek, Badger Creek, and in isolated trees along agriculture fields where they forage in adjacent grasslands and agriculture crops. Five nest locations were identified in the project areas during surveys conducted in April and May 2002. Second year surveys were conducted for active nest sites in April 2003, which identified approximately 7 active and 2 potential nest locations that could be affected by construction noise. Protection measures include limiting activities until young hawks are fledged or monitoring them for signs of stress.

Protection measures were also identified to reduce impacts to habitats and wildlife during construction activities:

- € Worker Environmental Awareness Training Program to inform construction workers of their responsibilities for protecting species and habitats, including timing restrictions and other limitations in sensitive areas.
- € Having biological monitors on site during construction to implement and document compliance with conditions of certification and conditions of agency permits.
- € The designated biologist and biological monitors will have authority to stop construction if conditions are not implemented in accordance with LORS.

By implementing the mitigation and protection measures for special-status species developed through consultation with USFWS, NMFS, and CDFG, described in the BRMIMP, Biological Assessment, FSA, and forthcoming permit conditions, the CPP would not jeopardize the continued existence of any listed species. These mitigation and protection measures also demonstrate:

- (1) That the facility will be designed, sited, and operated in compliance with applicable federal, state, regional and local laws, ordinances, regulations, and standards (LORS);
- (2) That the facility will be designed, sited and operated to protect biological resources; and to ensure that any potential biological impacts will be avoided or mitigated to a level of insignificance.

III. Declaration

I, Debra Crowe, declare as follows:

10. I am presently a wildlife and wetlands biologist at CH2MHILL.
11. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
12. I helped prepare the testimony on Biological Resources for the Cosumnes Power Plant based on my professional experience and knowledge.
13. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.
14. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 5, 2003

Signed: _____

At: Sacramento, CA

ATTACHMENT 1

MEMORANDUM

CH2MHILL

SMUD Cosumnes Power Plant Project Condition of Certification BIO-18: Preconstruction Surveys for Nesting Burrowing Owl, Swainson's Hawk, Raptors and Songbirds, April 2003

TO: Debra Crowe/CH2MHILL

FROM: Victor Leighton III/CH2MHILL
Richard Crowe/CH2MHILL
Chris Green/CH2MHILL

DATE: May 5, 2003

1.0 INTRODUCTION

1.1 Project Description and Location

The proposed Cosumnes Power Plant (CPP) project is located in southern Sacramento County, California (Figure 1). The 30-acre CPP site is located on Sacramento Metropolitan Utility District (SMUD) property near the non-operational Rancho Seco Nuclear Power Plant. A temporary construction laydown area approximately 18 acres in size is proposed south of the CPP site. A 26-mile-long natural gas pipeline is proposed to connect the CPP to an existing Pacific Gas and Electric (PG&E) backbone pipeline at the Carson Cogeneration facility in the town of Elk Grove. The gas pipeline alignment extends from the CPP site along county and farm road rights-of-way and the Southern Pacific railroad (SPRR) right-of-way (ROW).

Surveys for nesting burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), and other birds are required in the proposed construction impact areas prior to the start of construction for the CPP as a Condition of Certification (COC) BIO-18. The surveys were conducted at the proposed CPP site, temporary construction laydown area (including an alternative 15-acre area west of the site), and along the gas pipeline alignment to fulfill COC BIO-18. The following provides a description of methods and results of the surveys. For a list of all wildlife species observed during the surveys is presented in Table 1. Photos of representative field observations are presented in Attachment 1. Additional preconstruction surveys will be conducted 48 hours prior to construction ground disturbance as required in BIO-18.

1.3 Setting

The CPP site and laydown area consists of annual grassland with intermittent swales and seasonal wetlands. The site and laydown areas are currently grazed by cattle. The primary habitats along the gas pipeline alignment are ruderal roadside vegetation, agricultural crop,

annual grassland, and railroad access roads that lack vegetation. Seasonal ponding areas occur in many of these habitat types.

2.0 Methods

2.1 Survey Conditions

The surveys for burrowing owl, Swainson's hawk, and other nesting raptors and birds, included the natural gas pipeline, CPP site and laydown areas. Surveys were conducted on April 17-18, 21-23, and 28, 2003. Weather for the survey dates April 17-18, 21-23, 2003 were sunny, clear to partly cloudy, with temperatures ranging from 50 to 70 degrees Fahrenheit, wind north to northwest from 1 to 7 miles per hour. On April 28th the weather was partly cloudy to overcast, with temperatures +/- 50 degrees Fahrenheit, and winds south, southwest from 5 to 10 miles per hour and gusts to 15 miles per hour. A light to moderate rain event was encountered in the last hour of the surveys, however, no potential burrowing owl refugia or Swainson's hawk nesting structures that could have supported these species were encountered during this time. Surveys were conducted between 0800 hours and 1700 hours daily.

2.2 Burrowing Owl Surveys

A burrowing owl survey was conducted during the 2003 nesting season using the 'protocol' survey methods described in California Department of Fish and Game *Staff Report on Burrowing Owl Mitigation*, September 25, 1995 (CDFG 1995). A habitat assessment was conducted for the project areas to determine if suitable habitat occurs in construction impact areas and adjacent lands. Three qualified CH2M HILL biological staff, Richard Crowe, Chris Green, and Victor Leighton walked multiple meandering transects to allow 100 percent visual inspection of the entire 26-mile natural gas pipeline corridor, CPP Site, and laydown areas. Surveys included covering an area 500 feet (approximately 150 meters) from the edge of the project impact zones. On private property where access was limited or not allowed visual inspection with the aid of binoculars and spotting scopes were used to aid in visual observations. All the areas were inspected to identify burrowing owl occupancy or potential burrow/nesting structures. All California ground squirrel (*Spermophilus beecheyi*) burrows, culverts, cement, asphalt, wood debris piles, or other potential structures were visually inspected for occupancy of burrowing owls or burrowing owl sign, such as molted feathers, cast pellets, prey remains, white wash or other information showing burrowing owl occupancy. Any potential burrowing owl and/or ground squirrel burrow sites were mapped on aerial photos of the project alignment and presented on Figure 1.

2.3 Swainson's Hawk and Nesting Raptors Presence/Absence Surveys

Presence or absence Swainson's hawk nest surveys were conducted using the Swainson's Hawk Technical Advisory Committee *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys In California's Central Valley*, May 31, 2000 (TAC 2000). Complete protocol level surveys were not conducted in April since Swainson's hawks were observed in early stages of nesting behavior, possibly due to the late rainy season in 2003. Numerous Swainson's hawk pairs and singles were observed during this survey, however, the majority of observations were territorial display, courtship, and multiple nest site affiliations. Based

on these observations the surveyors agreed that protocol level surveys at the time would not result in definitive nest sites. Therefore, all active and potential nest sites locations were mapped to allow for efficient follow-up surveys.

To meet the CDFG recommendations for protection of active Swainson's hawk nest sites, surveys were conducted in a ½ mile radius around all project activities (TAC 2000). Binoculars and spotting scopes were used to distinguish details of subject birds and to positively identify nesting locations. Multiple angles were utilized to increase in visual observation of all trees to aid in detecting nest or hawks. Driving or "windshield surveys" were also used to approach hawks without causing them to fly. Visual and aural cues were also used to distinguish territories and nesting locations. Territorial displays, calling, courtship, nest building, and mating activities were used to locate and identify all potential nest sites. Where nest sites were positively identified a GPS (Global Positioning System) point was taken and recorded on aerial photos and presented on Figure 1.

2.4 Nesting Birds

The transects used to search for burrowing owl and Swainson's hawk nest sites also allowed for focused surveys of other nesting birds. Nesting birds, nests, eggs, and young are protected under the California Fish and Game Code 3503. All nest sites were recorded on aerial photo maps and a location was recorded with GPS (Figure 1).

3.0 Results

Results of the nest survey that was recorded by GPS is presented on the topographical base map of the project area (Figure 1). Attachment 1 includes photographs of burrowing owl, Swainson's hawk, and nests observed during the surveys.

3.1 Burrowing Owl

Burrowing owl habitat can be found in annual and perennial grasslands, deserts, arid scrublands characterized by low-growing vegetation. Suitable owl habitat may also include trees and shrubs if the canopy covers less than 30 percent of the ground surface. Burrows are the essential component of burrowing owl habitat: both natural and artificial burrows provide protection, shelter, and nest for burrowing owls. Burrowing owls typically use burrows made by fossorial mammals, such as ground squirrels or badgers, but also may use man-made structures such as cement culverts; cement, asphalt or wood debris piles; or openings beneath cement or asphalt pavement (Consortium 1993). Suitable habitat for burrowing owls occurs in several localized areas along the gas pipeline alignment (Figure 1).

No active burrowing owl nest sites or burrowing owl evidence was observed along the pipeline route, plant site or laydown areas within or near the 500 foot project impact zone, although several potential burrowing owl burrow sites were identified and mapped on Figure 1. The following identifies the sites with suitable habitat and greatest potential for burrowing owl occupancy.

- ∞ Historical data from Sacramento Regional County Sanitation District (SRCSD) resource specialists for burrowing owls occurs along Simms Road and along the ballast of

Southern Pacific Rail Road (SPRR) tracks. See SRCSD Historic/Present Burrowing Owl map Figure 2. One burrowing owl was observed next to a ground squirrel burrow located on the edge of the drainage ditch that runs along the north side of Simms Road. This site is over 1,400 feet from the pipeline corridor and would not be affected by the CPP project.

- € A large colony of ground squirrels and burrows were observed along a dirt road/fenceline north of Core Road approximately 1400 feet east of SPRR tracks. Burrows start approximately 50 feet from the north edge of Core Road and occur for several hundred feet to the north. This area could attract burrowing owls in the future and is adjacent to the proposed pipeline (Figure 1), however, no impacts are anticipated from the CPP.
- € Numerous ground squirrel burrows were observed along the dirt road and pipeline alignment ROW south of Eschinger Road. This location is between Eschinger Road and the northwest side of the horizontal directional drill for the Cosumnes River crossing. Burrows are also found around old farm labor buildings in this same location (Figure 1). No burrowing owls or sign were observed at this location and no burrowing owls would be affected by CPP.
- € Ground squirrel burrows were observed randomly along Twin Cities Road along the incised berms that run along SPRR tracks and within adjacent livestock pens (Figure 1). This area is adjacent to the proposed pipeline, however, no burrowing owls or sign was observed, and none would be affected by the CPP project.
- € A large colony of ground squirrels and burrows were observed over most of the CPP site as well as adjoining areas to the north. The majority of the burrows occurred along the western fenceline and along the drainages that meander through the area and adjoining areas to the north (Figure 1). No burrowing owls or sign were observed at any of the burrows and no burrowing owls would be affected by CPP.
- € Numerous ground squirrels burrows were observed on the eastern edge of the southern laydown area (Figure 1). No burrowing owls or sign were observed at any of the burrows and no burrowing owls would be affected by CPP.

3.2 Swainson's Hawk

Swainson's hawk nesting in the Central Valley of California are generally found in scattered trees or along riparian systems adjacent to agricultural fields or pastures. These open fields and pastures are the primary foraging areas. Major prey items for Central Valley birds include: California voles (*Microtus californicus*), valley pocket gopher (*Thomomys bottae*), deer mice (*Peromyscus maniculatus*), California ground squirrels (*Spermophilus beecheyi*), morning dove (*Zenaida macroura*), ring-neck pheasant (*Phasianus colchicus*), meadowlarks (*Sturnella neglecta*), other passerines, grasshoppers (*Conocephalinae sp.*), crickets (*Gryllidae sp.*), and beetles. Swainson's hawks generally search for prey by soaring in open country and agricultural fields similar to northern harriers (*Circus cyaneus*) and ferruginous hawks (*Buteo regalis*). Often several hawks may be seen foraging together following tractors or other farm equipment capturing prey escaping from farming operations (CDFG 1994). Swainson's

hawks accustomed to farming equipment may readily accustom to some types of construction equipment.

Numerous pairs and single Swainson's hawks were observed along various locations over the entire project alignment, these sites were recorded and mapped on aerial photos and with GPS. At the time of the surveys in April only three Swainson's hawks were observed sitting on nests. At the remaining nest sites, active nest building was observed by males and females as well as frequent visits to selected nest trees. Territorial and courtship displays and vocalizations were also observed at all the remaining nest locations. Although these pairs may not successfully nest/reproduce this year, all identified nest locations where nest fidelity was identified were classified as a nesting pair for this survey. All active and potential nest location were recorded by GPS points and mapped on aerial photo maps (Figure 1).

3.2.1 Swainson's Hawk Nest Locations

The following describes the Swainson's hawk activities observed for each active and potential nest location. The numbers referenced here correspond to the locations identified on Figure 1.

- € SWHA-03 #1. An active nest site. A dark morph pair was observed using a nest structure in a eucalyptus (*Eucalyptus globulus*) tree. The nest tree is located north of Bufferlands Road on Sacramento Regional County Sanitation District (SRCSD) property. This nest site was an active nest location during the 2002 nesting season. This site is approximately 1000 feet from the pipeline alignment.
- € SWHA-03 #2. An active nest site. A pair consisting of a dark morph and an intermediate morph, was located southeast of the junction of Franklin Road and Elk Grove Boulevard. The pair was observed in the area carrying sticks to a nest in a Valley oak (*Quercus lobata*) and perched in nearby trees. This nest location is approximately 500 feet from the pipeline alignment. A Great-horned owl with two young was also observed in a Valley oak approximately 500 feet to north of this nest site (Figure 1).
- € SWHA-03 #3. An active nest site. A pair consisting of a dark morph and an intermediate morph was observed north of the junction of Bilby Road and Franklin Boulevard. The nest was located in a sycamore (*Platanus racemosa*) tree in the back yard of a residence . Swainson's hawks were observed bringing sticks to the nest, placing sticks, and sitting in the nest. Swainson's hawk were observed eating western meadow lark in nearby tree. This nest location is approximately 750 feet from the pipeline alignment.
- € SWHA-03 #4. An active nest site. A pair was observed south of Core Road. The nest tree is in the back of residence. Swainson's hawks were observed in courtship display, and carrying sticks to the tree. This site is approximately 400 feet from the pipeline alignment.
- € SWHA-03 #5. An active nest site. A Swainson's hawk pair, with one light morph, was observed foraging east of Bruceville Road and one bird was observed flying into a tree with a nest in a small willow grove. This site is approximately 900 feet from the pipeline alignment.

- € SWHA-03 # 6. An active nest site. A pair was located southeast of the Cosumnes River HDD crossing. A female was observed on the nest, with the male nearby defending the territory from red-tailed hawks to the southwest. A red-tailed hawk nest was observed approximately 600 feet from active Swainson's hawk nest (Figure 1). The Swainson's hawk nest is approximately 2000 feet from the pipeline alignment.
- € SWHA-03 #7. An active nest site. A pair was located approximately 350 feet north of Valensin Road. A Swainson's hawk was observed sitting on a nest in a willow tree (*Salix* sp.) at the north end of an irrigation pond.
- € SWHA-03 #8. A potential nest site. A Swainson's hawk pair was observed near Hicksville Cemetery. Although no nest site was observed, several potential nest sites occur in the cemetery as well as south of Arno Road. Numerous trees are located along dirt road adjacent to agricultural field. This area will be monitored for further activity.
- € SWHA-03 #9. A potential nest site. A single dark morph bird was observed sitting in pine tree near Arno Road and Valensin Road within the back corner of a residence. A possible nest location is within dense grove of trees associated with this residence. This Swainson's hawk was observed perched in the pine tree at this location on separate days during the survey and is located approximately 1,200 feet north of Valensin Road. This area will be monitored for further activity.
- € SWHA-03 #10. A potential nest site. Several Swainson's hawks were also observed along the tree line north of Core Road and Ed Rau Road, with several potential nesting opportunities occurring in this area. Because numerous Swainson's hawks were observed at this location with no obvious nest affiliation, additional nest sites could be identified later in the season and should be identified prior to construction when nest sites are more defined. This area will be monitored for further activity.
- € SWHA-03 #11. A potential nest site. A pair of Swainson's hawks were observed in eucalyptus trees northwest of the CPP site along Clay Creek. Foraging, courtship displays and vocalizations were also observed between this pair, however no nest was observed. A nest sites could be identified later in the season and should be identified prior to construction when nest site is more defined. This location is approximately ½ mile from the CPP site. This area will be monitored for further activity.

3.3 Nesting Raptors/Nesting Birds

Several nesting raptor sites were identified along the entire project alignment, these sites were recorded and mapped on aerial photos with GPS and transferred to Figure 1. These sites include great-horned owl (*Bubo virginianus*), barn owl (*Tyto alba*), and red-tailed hawk (*Buteo jamaicensis*).

White-throated swifts (*Aeronautes saxatalis*) and cliff swallows (*Hirundo pyrrhonota*) were observed entering into the bottom holes of the Laguna Boulevard bridge. Birds appeared to be using the bridge internal structure for nesting (Figure 1). Cliff swallows were also observed using a small bridge structure northwest of the CPP site. This bridge is along access road that runs along the western border of the CPP site (Figure 1).

Several other nest sites used by songbirds were recorded during the surveys and included on Figure 1. These areas may require nest substrate removal prior to the next nesting season in 2004 to prevent harming active nests, eggs, or young during construction. Removing nesting substrate will also minimize construction delays in those areas.

3.4 Stick Nests

Stick nest are loosely woven structures mad of small branches and twigs, typically built by yellow-billed magpies (*Pica nuttalli*), hawks, and American crows (*Corvus brachyrhyncho*). Stick nests offer potential nesting habitat for Swainson's hawks and other raptors. These sites were recorded to aid in potential nest location on future raptor surveys. Stick nests were also recorded with GPS and shown on Figure 1.

4.0 Incidentals Observations

Clay Creek north of the CPP site contained flowing water approximately 6 to 18 inches deep. The ponding areas supported vernal pool plant species such as *Downingia* sp., coyote thistle (*Eryngium castrense*), wooly marbles (*Psilocarphus* sp.), goldfields (*Lasthenia glabrata* and *Lasthenia fremontii*), popcorn flower (*Plagiobothrys* sp.), and spikerush (*Eleocharis* sp.). Some of the ponding areas within Clay Creek had the typical vernal pool rings of flowers. Mosquito fish were present in portions of Clay Creek and mallards and great egrets were observed foraging on them. The intermittent swales on the site also contained dense stands of vernal pool plants of the species listed above. The swales have a cobble substrate. Large deep pools on the northern edge of CPP site had standing water up to 24" deep in the center of the with vegetation existing only along the pools margins. A frog was observed along the pools margin and disappeared into the bottom of pool before identification could be made. Bull frogs were also observed in the drainages that fed in to these pools along the southern fenceline of Rancho Seco. A common garter snake (*Thamnophis sirtalis*) was observed near the edge of pool.

A western terrestrial garter snake (*T. elegans*) was observed along railroad ballast north of Simms Road and WPRR tracks near edge of drainage ditch containing cattails (*Typha latifolia*).

Three western pond turtles were observed within ponds in the Cosumnes Preserve area adjacent to the pipeline ROW. Locations of these pond turtles was recorded with GPS points and included on Figure 1.

The pipeline alignment was field verified in relation to trees to assure that all trees to be impacted by the pipeline construction were identified during previous field surveys. No additional trees were identified that would be removed during the field survey that have not already been identified and permitted.

5.0 Conclusion and Recommendations

Surveys were conducted during the appropriate time of year to identify nesting locations for burrowing owls, Swainson's hawks, nesting raptors, and other nesting bird species.

Suitable habitat occurs along the majority of the pipeline alignment and CPP site for burrowing owls however, no burrowing owl nest or burrowing owls were observed during the 2002 or 2003 surveys.

Although the surveys were conducted during the beginning of the Swainson's hawk nesting season, the surveys adequately identified several active and potential nest sites that would be monitored during construction activities. Seven active Swainson's hawk nests and two potential nest locations were identified within the ½ mile buffer recommended mitigation buffer by CDFG (TAC 2000) during the 2003 nesting season. Numerous Swainson's hawks were observed foraging and circling in the Cosumnes River Preserve area, however, only one positive nest location was identified and recorded.

Additional preconstruction surveys for Swainson's hawk, nesting raptor, and burrowing owls would be conducted 48 hours prior to any construction activities if construction is to occur during the nesting season (March through August 15).

Several areas along the pipeline alignment that harbor concentrations of nesting swallow and swifts occur on the bridges. Construction should not affect these nests since no work is proposed on the bridges. If construction activities could affect these birds the nest holes should be cleared or sealed prior to ground disturbance and out side of the nesting season. The need for nest substrate removal will be analyzed with project impact areas and if necessary, conducted outside the nesting season.

This survey fulfills Conditions of Certification BIO-18, noting additional preconstruction surveys will be conducted 48 hours prior to ground disturbance.

ATTACHMENT 1

REFERENCES

- CDFG (California Department of Fish and Game). 1995. *Staff Report on Burrowing Owl Mitigation*. September 25, 1995.
- CDFG (California Department of Fish and Game). 1994. *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley*. November 1, 1994
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ATTACHMENT 1

Table 1.	
Wildlife Species Observed in the Cosumnes Power Plant Project and Linear Facilities April 17-18, 21-23, 28, 2003	
Birds	
Common Name	Scientific Name
Pied-billed grebe	<i>Podilymbus podiceps</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Canada goose	<i>Branta canadensis</i>
Gadwall	<i>Anas strepera</i>
Mallard	<i>Anas platyrhynchos</i>
Wood duck	<i>Aix sponsa</i>
Cinnamon teal	<i>Anas cyanoptera</i>
American coot	<i>Fulica americana</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
Gull sp.	<i>Larus sp.</i>
Great blue heron	<i>Ardea herodias</i>
Green heron	<i>Butorides virescens</i>
Great egret	<i>Ardea alba</i>
Snowy egret	<i>Egretta thula</i>
Black-bellied plover	<i>Pluvialis squatarola</i>
Killdeer	<i>Charadrius vociferus</i>
Long-billed curlew	<i>Numenius americanus</i>
Greater yellowlegs	<i>Tringa melanoleuca</i>
Common snipe	<i>Gallinago gallinago</i>
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>
Wild turkey	<i>Meleagris gallopavo</i>
Ring-necked pheasant	<i>Phasianus colchicus</i>
California quail	<i>Callipepla californica</i>
White-tailed kite	<i>Elanus leucurus</i>
Northern harrier	<i>Circus cyaneus</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Red-shouldered hawk	<i>Buteo lineatus</i>

Turkey vulture	<i>Cathartes aura</i>
American kestrel	<i>Falco sparverius</i>
Barn owl	<i>Tyto alba</i>
Great horned owl	<i>Bubo virginianus</i>
Burrowing owl	<i>Athene cunicularia</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Mourning dove	<i>Zenaida macroura</i>
Rock dove	<i>Columba livia</i>
Anna's hummingbird	<i>Calypte anna</i>
Acorn woodpecker	<i>Malanerpes formicivorus</i>
Northern flicker	<i>Colaptes auratus</i>
Nuttall's Woodpecker	<i>Picoides nuttallii</i>
Western kingbird	<i>Tyrannus verticalis</i>
Black phoebe	<i>Sayornis nigricans</i>
White-throated swift	<i>Aeronautes saxatalis</i>
Tree swallow	<i>Tachycineta bicolor</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Barn swallow	<i>Hirundo rustica</i>
American crow	<i>Corvus brachyrhynchos</i>
Common Raven	<i>Corvus corax</i>
Western scrub jay	<i>Aphelocoma californica</i>
Yellow-billed magpie	<i>Pica nuttalli</i>
Bushtit	<i>Psaltriparus minimus</i>
Northern mockingbird	<i>Mimus polyglottos</i>
American robin	<i>Turdus migratorius</i>
Western bluebird	<i>Sialia mexicana</i>
Northern shrike	<i>Lanius excubitor</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
European starling	<i>Sturnus vulgaris</i>
Cedar waxwing	<i>Bombcilla cedrorum</i>
Yellow-rumped warbler	<i>Dendroica coronata</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>

Tricolored blackbird	<i>Agelaius tricolor</i>
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>
Western meadowlark	<i>Sturnella neglecta</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Bullock's oriole	<i>Icterus bullockii</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Golden-crowned sparrow	<i>Zonotrichia atricapilla</i>
Song sparrow	<i>Melospiza melodia</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Spotted towhee	<i>Pipilo maculatus</i>
California towhee	<i>Pipilo crissalis</i>
House finch	<i>Carpodacus mexicanus</i>
American goldfinch	<i>Carduelis tristis</i>
House sparrow	<i>Passer domesticus</i>
Reptiles/Amphibians	
Bullfrog	<i>Rana catesbeiana</i>
Common kingsnake	<i>Lampropeltis getulus</i>
Western fence lizard	<i>Sceloporus occidentalis</i>
Western pond turtle	<i>Clemmys marmorata</i>
Western terrestrial garter snake	<i>Thamnophis elegans</i>
Common garter snake	<i>Thamnophis sirtalis</i>
Yellow-bellied racer	<i>Coluber constrictor</i>
Mammals	
Audubon cottontail	<i>Sylvilagus audubonii</i>
Beaver	<i>Castor canadensis</i>
California ground squirrel	<i>Spermophilus beecheyi</i>
Black-tailed hare	<i>Lepus californicus</i>
California meadow mouse	<i>Microtus californicus</i>
Muskrat	<i>Ondatra zibethicus</i>
Coyote	<i>Canis latrans</i>
Raccoon	<i>Procyon lotor</i>
Mule deer	<i>Odocoileus hemionus</i>
Striped skunk	<i>Mephitis mephitis</i>

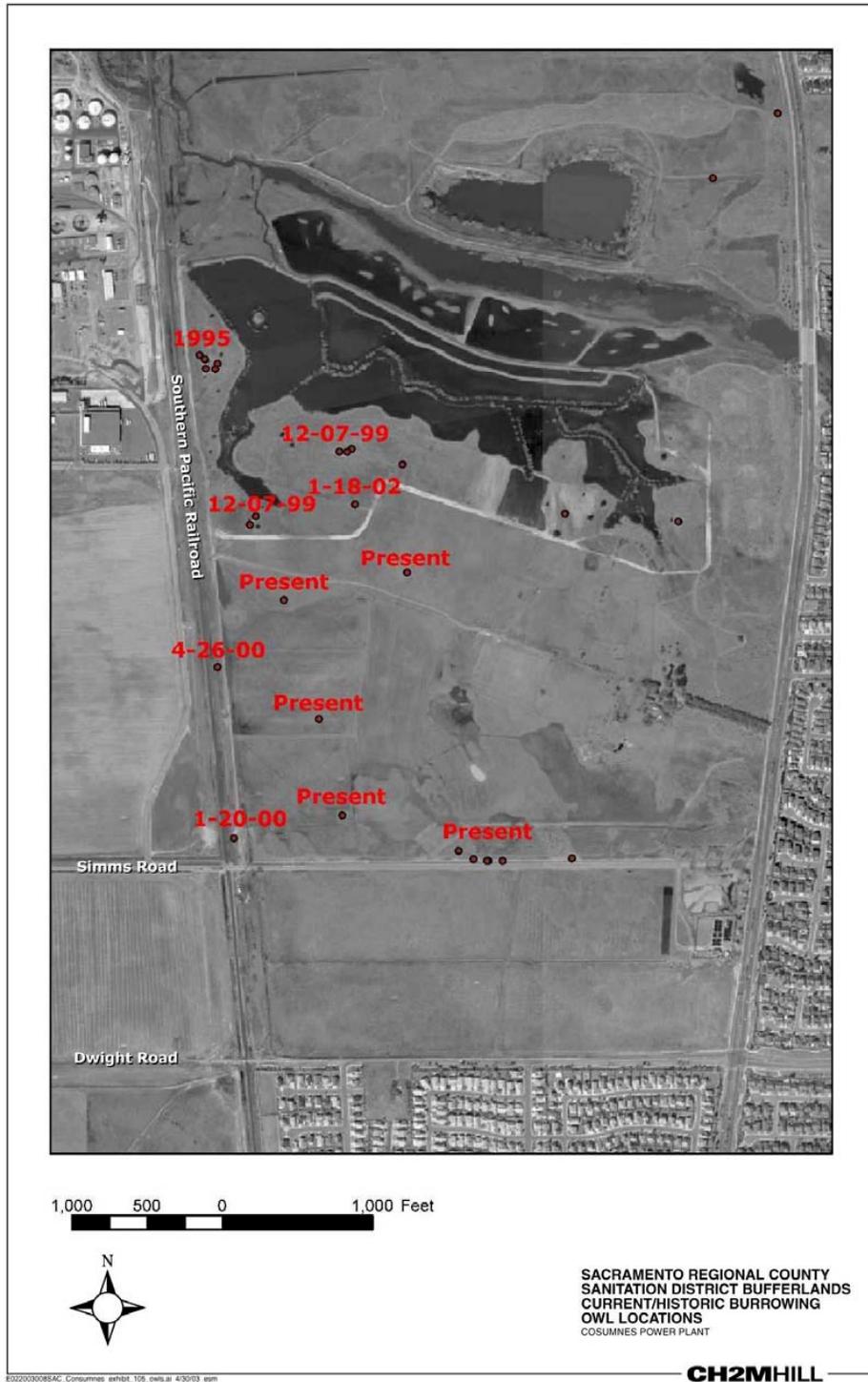
ATTACHMENT 1

Figure 1
Maps/Nest Locations

ATTACHMENT 1

Figure 2
Current/Historical Burrowing Owl location SRCSD

ATTACHMENT 1



ATTACHMENT 1

Attachment 1

Photos



Burrowing owl north edge of Simms Road, SRCSD Bufferlands.



Swainson's hawk lower left corner, nest upper right corner SRCSD Bufferlands Road.



Swainson's hawk eating western meadow lark, near Franklin Road and Bilby Road.



Swainson's hawk pair Core Road.



Bushtit (*Psaltriparus minimus*) nest in Valley oak.



Great horned owl with young, SRCSD, Bufferlands Road.



Mourning dove (*Zenaidura macroura*) nest on ballast of railroad tracks.



Northern mocking (*Mimus polyglottos*)bird nest in olive tree.

ATTACHMENT 2

**COSUMNES POWER PLANT PIPELINE PROJECT
2003 AQUATIC AMPHIBIAN AND REPTILE SURVEYS**

Final Report

Prepared for

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May 04, 2003

INTRODUCTION

The Cosumnes Power Plant Pipeline is a project located in southern Sacramento County that proposes to bury a 26-mile (=41.8-km) long power cable from Carson Cogen near Elk Grove, to Rancho Seco east of the town of Clay. In accordance with requests by California Department of Fish and Game personnel, the following aquatic amphibian and reptile surveys were conducted for a second season during the proper time period (March 15-May 15, 2003) in order to determine the presence and potential habitat of special status species within a 5 km distance of either side of the proposed pipeline corridor. Incidental observations of other special status or listed species are also included in this report. As stated in the previous survey report for 2002 (Jennings and Padgett-Flohr 2002), the following State Species of Special Concern aquatic amphibians and reptiles were surveyed for: California tiger salamander (*Ambystoma californiense*) western spadefoot (*Spea hammondi*), and western pond turtle (*Clemmys marmorata*). The giant gartersnake (*Thamnophis gigas*), a Federal and State-listed Threatened Species, was once again not presumed to occur within the specific survey area of the proposed pipeline route because of the lack of certain suitable aquatic and terrestrial habitats required by this species (U.S. Fish and Wildlife Service 1999). However, we carefully checked any gartersnakes (*Thamnophis* spp.) observed during our surveys in order to confirm if giant gartersnakes could be present within the overall areas we surveyed.

MATERIALS AND METHODS

All surveys were conducted under the authority of Federal Permit PRT# TE-006112-1, issued by the U.S. Fish and Wildlife Service and Scientific Collecting Permit #801160-02 and #801006-02 issued by California Department of Fish and Game to the authors. The entire pipeline route and all accessible areas within 3.1 miles (=5 km) of either side of the pipeline corridor were surveyed for California tiger salamander larvae and other aquatic amphibians and reptiles during the period of March 15 to May 15, 2003 before weather conditions began to completely dry temporary rain-filled pools and vernal pools in

the region. Larval salamanders were surveyed following the protocol of Brode (1997). Other amphibians and reptiles were noted using ocular and road riding survey techniques that have been successfully employed by the authors for the past 2 decades.

All accessible aquatic habitats were surveyed twice during the day on April 13 and May 3, 2003, and carefully sampled with fine mesh and 0.25-inch (= 0.6-mm) mesh dip nets, as well as a 0.25-inch (=0.6-mm) mesh two-pole seine. All equipment and clothing was cleaned with bleach after each survey utilizing the protocol outlined in Padgett-Flohr (2002). As stated earlier in Jennings and Padgett-Flohr (2002), we were largely limited to surveying and sampling aquatic habitats along public roads, railroad right-of-ways, the Cosumnes River Preserve, and the Rancho Seco square because of restrictions by private landowners in the area. However, we were able to survey the entire pipeline corridor and note the potential for any negative effects on special concern or listed species.

In order to organize the results of this report, the areas surveyed are broken down into five major locations:

- 1). Corridor next to the Western Pacific Railway right-of-way (MP 0.00-MP 6.24).
- 2). Corridor north of Eschinger Road to the Cosumnes River (MP 6.24-MP 12.39).
- 3). Corridor from the Cosumnes River to Laguna Road (MP 12.39-MP 21.58).
- 4). Corridor from Laguna Road (along the railroad right-of-way) to the town of Clay (MP 21.58-MP 23.93).
- 5). The Rancho Seco square (area to the north of Clay East Road) [MP 23.93-END].

RESULTS

The conditions for surveying this season were considered to be excellent because of the large amount of rainfall that occurred during the month of April. In fact, rain occurred on both days that surveys were conducted in the field.

California tiger salamander larvae were found on April 13, 2003 immediately south of the Rancho Seco square at the same vernal pool that contained California vernal pool tadpole shrimp (*Lepidurus packardii*) last year. The exact location of this pool is 2.4 miles east of the Hwy 104/Clay East Road junction on the south side of Clay East Road.

A single dead, and partly decomposed giant gartersnake was found on April 13, 2003 on the northwest corner of the junction of Clay Station Road and Hwy 104. The snake was too decomposed to keep as a voucher specimen. However, based on coloration and scale counts, it was definitely an adult giant gartersnake.

An adult western pond turtle was observed sunning itself on May 3, 2003 on a rock next to Hadselville Creek, about 0.8 road miles west of the Clay. This spot is immediately adjacent to the railroad tracks.

No western spadefoot larvae were found during any of the surveys again this year. According to records in the California Natural Diversity Database, there are no records for western spadefoots within the area sampled, although they are present at sites in the southeast part of the County (Jennings and Hayes 1994). Virtually all the vernal pools we sampled had been colonized by dozens of juvenile bullfrogs (*Rana catesbeiana*), a voracious predator that was first introduced into California in 1896 (Jennings and Hayes 1985) and is known to consume California tiger salamander larvae, western spadefoot larvae, and other special concern amphibians and invertebrates (Morey and Guinn 1992). Bullfrogs are well established on the Central Valley Floor (Moyle 1973) and are present within all perennial aquatic habitats within the survey area where they have built up very large populations.

Besides bullfrogs, we also found the larvae, juveniles, and adults of Pacific treefrogs (*Hyla regilla*) to be present in almost all the aquatic habitats we sampled. Pacific treefrogs have the ability to utilize most types of freshwater aquatic habitats for breeding, as long as these habitats hold water for at least 2 months (Jameson 1956).

For more detailed information of our survey results, they are as follows:

1). Corridor next to the Western Pacific Railway right-of-way (MP 0.00-MP 6.24) [surveyed on April 13 and May 3, 2003]—

We found only Pacific treefrog larvae in the remaining intermittent aquatic habitats. No other amphibians were found in this area which is continuing to undergo rapid urbanization.

2). Corridor north of Eschinger Road to the Cosumnes River (MP 6.24-MP 12.39) [surveyed on April 13 and May 3, 2003]—

We found juvenile bullfrogs and larval Pacific treefrogs in the limited roadside aquatic habitats. Fish ponds, stock watering ponds, and other perennial aquatic habitats were observed to contain juvenile and adult bullfrogs, Pacific treefrogs, and introduced fishes including mosquitofish (*Gambusia affinis*), channel catfish (*Ictalurus punctatus*), and bluegill (*Lepomis macrochirus*). There are a number of commercial catfish ponds along this section of the pipeline route. We presume there are probably western pond turtles in the perennial aquatic habitats near the Cosumnes River.

3). Corridor from the Cosumnes River to Laguna Road (MP 12.39-MP 21.58) [surveyed on April 13 and May 3, 2003]—

We found almost all of the vernal pools contained bullfrogs in good numbers (of all life stages) and Pacific treefrog larvae, juveniles, and adults. The aquatic habitats are suitable for western pond turtles and western spadefoots. One dead valley gartersnakes (*Thamnophis sirtalis fitchi*) was observed on Valensin Road west of the site of the Centralia rail stop.

4). Corridor from Laguna Road (along the railroad right-of-way) to the town of Clay (MP 21.58-MP 23.93) [surveyed on April 13 and May 3, 2003]—

We found dozens of vernal pools along the railroad right-of-way here (on both sides of the tracks). Historically, this was probably California tiger salamander breeding habitat. However, today this area is

full of juvenile bullfrog which have colonized these ponds from nearby perennial aquatic habitats (e.g., Hadselville Creek). When present, these juvenile bullfrogs eat almost any living organisms they can consume. Other organisms found include Pacific treefrog larvae, juveniles, and adults, California fairy shrimp (*Linderiella occidentalis*), and clam shrimp (*Cyzicus californicus*). The fairy shrimp and clam shrimp were found at the same location as stated last year (Jennings and Padgett-Flohr 2002). The vernal pool fairy shrimp (*Branchinecta lynchi*) that was found on this reach last year was not observed this year-- probably due to the lateness of the sampling season. This latter fairy shrimp is a Federal and State listed Endangered Species.

5). The Rancho Seco square (area to the north of Clay East Road) [MP 23.93-END] [surveyed on April 13 and May 3, 2003]—

We found the aquatic habitats in the square (especially the old dredge pond areas) to be inhabited by larval Pacific treefrogs, introduced Louisiana red-swamp crayfish (*Procambarus clarkii*), mosquitofish, smallmouth bass (*Micropterus dolomieu*), and larval, juvenile, and adult bullfrogs. The aquatic habitats are suitable for western pond turtles and the vernal pool habitats are suitable for western spadefoots. The stream habitats were observed to contain bullfrog larvae, Louisiana red-swamp crayfish, and mosquitofish. All of the ponds and pools were filled to capacity with water due to recent rainfall. Very large adult clam shrimp were noted in two small ephemeral ponds in the vicinity of the dredge piles. California vernal pool tadpole shrimp (*Lepidurus packardi*) were not found this year in the large vernal pool on the south side of Clay East Road near the entrance of Dry Creek Ranch in the road right of way. Instead, we found two California tiger salamander larvae there. There are presumably other California tiger salamander breeding ponds nearby on Dry Creek Ranch. However, we were unable to gain access to survey this property.

CONCLUSIONS

Based on California Natural Diversity Data Base records and our surveys, it appears that suitable habitat for California tiger salamanders and western spadefoots is present only within survey areas 3, 4, and 5 (*i.e.* the Cosumnes River Preserve, railroad right-of-way, and the Rancho Seco square). However, the presence of abundant bullfrog populations in these three areas severely restricts the ability these species to successfully reproduce and survive in the restricted aquatic habitats available. The presence of introduced fishes and crayfish in permanent and intermittent aquatic habitats are also deleterious to the native amphibian fauna (Jennings and Hayes 1994) and in tandem with bullfrogs, probably limits the successful recruitment of the small population of California tiger salamanders on the Rancho Seco square. Western pond turtles are present within these surveyed areas, but are largely restricted to perennial aquatic habitats outside the pipeline corridor right-of-way. We observed extensive habitat degradation along the proposed pipeline corridor route in areas 3 and 4 due to established roads (where animals can be run over), man-made canals, vineyards, feed lots, residential landscaping, and other agricultural activities. The railroad right-of-way in survey area 4 was disturbed several times by individuals during the month of April by driving ATVs and other vehicles through the vernal pools on both sides of the railroad tracks as they dried. Thus, any organisms present in these pools (such as listed fairy shrimp species) are already being negatively affected by human activities. It is our contention that if the pipeline construction is conducted during the summer-fall months (after all the vernal pools are dry), the pipeline is buried as it is laid, and a biological monitor is continuously present as the work is conducted, then there will be no negative effect on any special concern amphibian or reptile species that could potentially inhabit the immediate pipeline right-of-way.

As for the proposed power plant footprint on the Rancho Seco square, the area is considered potential adult California tiger salamander estivation habitat. Thus, it will have to be mitigated for. This could be accomplished by creating more suitable salamander breeding habitat on site within the Rancho Seco square and by modifying current aquatic habitats to make them more suitable for salamander larvae and much less suitable for introduced aquatic predators. The former can be done by digging small stock

ponds in several intermittent drainages. These ponds would be designed to hold water for only 4-5 months during seasons of average or greater than average rainfall. The current ponds could easily be made less suitable for introduced aquatic predators by making them more shallow and isolated from the stream course which presently flows into them. These ponds should only be designed to hold water for 4-5 months at most. Upon drying, this would kill all of the fishes and bullfrog larvae. This would also kill many crayfish. The resulting intermittent ponds would be suitable breeding habitat for any California tiger salamanders which would subsequently colonize them from the nearby vernal pool just south of Clay East Road. It is significant to note that this latter location contains a full complement of native species and currently lacks any introduced aquatic organisms. This is why it probably contains the present assemblage of listed and special concern species of invertebrates and amphibians.

Finally, one other option for potential mitigation is to purchase a suitable conservation easement from the adjacent Dry Creek Ranch. A likely piece of property would be the strip of land adjacent to Clay East Road.

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Biological Resources

I. Introduction

A. Name

Ellyn Miller Davis

My qualifications are summarized in the attached resume (Appendix A)

II. Summary

In June 2000 Davis Environmental Consulting prepared a delineation of waters of United States, including wetlands subject to the provisions of Section 404 of the Clean Water Act for 220-acres within which the proposed natural gas-fired power plant would be situated.

In February, March, April and May, 2001, Davis Environmental Consulting teamed with Garcia and Associates (GANDA) to conduct a biological resources constraints analysis and cultural resources assessment of the CPP project site and three alternative pipeline alignments, and prepared a report to support the Application for Certification (AFC) for the Cosumnes Power Plant under the regulations of the California Energy Commission.

Aerial photographs were reviewed to identify sensitive habitats within a one-mile radius of the project site and an approximate 2,000 foot corridor along each alternative pipeline alignment. Digital aerial photographic maps were used as a base map.

A search of the California Department of Fish and Game's Natural Diversity Database (CNDDB) was conducted to access any recorded data on rare, threatened, and endangered species known to occur in the project area or in the vicinity of the alternative pipeline corridors.

Davis Environmental Consulting's team of biologists conducted field surveys of the project site and mapped major habitat types and sensitive biological resources occurring or potentially occurring on the 220-acre power plant site. To the extent possible given the timing of the survey, suitable habitat for special-status species was identified. Where the seasonality of the survey prohibited special-status species identification, potential habitat for these species was identified. The work did not include directed or protocol-level surveys for individual species.

Aerial photography was used to evaluate land within a one-mile radius of the proposed power plant site and along the three proposed 2,000-foot wide pipeline corridors. All sensitive resources or potential sensitive resources (if visible on the maps) were identified and mapped onto the digital aerial photo base maps using a Geographic Information System (GIS). Because of restricted access, the work did not include surveys to "ground-truth" the results of the aerial photo interpretation.

A report describing the methods and results of the biological resources analysis was prepared that illustrated and described the extent of sensitive biological resource areas.

Potential direct and indirect impacts to special status species and sensitive habitats resulting from project construction were quantified.

Davis Environmental Consulting presented the results of the biological resources studies to the project engineers and evaluated the relative impacts and recommended mitigation measures that would be anticipated for alternative pipeline alignments.

Based on the total calculation of habitat types found within the 2000-foot corridors, Davis Environmental Consulting ranked all the segments of the three alternative pipeline alignments according to the relative magnitude of impacts to sensitive habitat types. After considering mitigation (i.e. habitat avoidance by crossing the road, directional drilling under creeks, etc.), all of the alignments were ranked as equal.

To the best of my knowledge, all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

III. Declaration

I, Ellyn Miller Davis, declare as follows:

1. I am presently a principal and owner at Davis Environmental Consulting.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared this testimony on Biological Resources for the Cosumnes Power Plant based on my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 5, 2003

Signed: _____

At: Sacramento, CA

BIOLOGICAL RESOURCES

Testimony of Terry Huffman, Ph.D.

WITNESS QUALIFICATIONS

Dr. Huffman has a unique combination of in-depth experience with ecological research and the environmental regulatory process. Prior to starting Huffman & Associates, Inc., a member company of Kleinschmidt Huffman-Broadway, Inc., he was the U.S. Army Corps of Engineers' (Corps) chief wetlands scientist responsible for the development of technology directed toward assisting the Corps Regulatory Program. While at the Corps' Environmental Laboratory in Vicksburg, Mississippi, Dr. Huffman developed the wetlands definition currently in use by the Corps and the U.S. Environmental Protection Agency (EPA). He also conducted research and development activities that pioneered the use of multiple field indicators to determine the presence or absence of wetlands vegetation, soil, and hydrology conditions. This seminal work led to the development of the wetland delineation methodology in use by the Corps today. As noted in the preface to the Corps' 1987 *Wetlands Delineation Manual*, Part II of the Manual is based on Dr. Huffman's 1980 paper, entitled *Multiple Parameter Approach to the Field Identification and Delineation of Wetlands*. Dr. Huffman also played a major role in developing the language pertaining to wetlands in the EPA 404(b)(1) project alternatives analysis, and was instrumental in the initial development of the Corps' long-standing wetlands research and training programs. His 20-plus years of work with the Corps and as a private consultant have provided Dr. Huffman with extensive onsite experience with virtually all types of aquatic and wetland environments and a unique understanding of the environmental permitting and compliance process.

Dr. Huffman has served as a project manager and principal investigator for multi-million-dollar nationally oriented research programs to aid in the implementation of federal and state policies and regulations, including the Rivers and Harbors Act of 1899, the National Environmental Policy Act of 1968, the Clean Water Act of 1972, and relevant Presidential Executive Orders. His experience also includes studies of plant communities and their relation to inundated soil conditions, assistance in the development of federal and state environmental regulations, development of field and remote sensing techniques for the identification and delineation of critical habitats, and the development of methods for habitat restoration for purposes of mitigating project impacts.

In addition to his research, Dr. Huffman has extensive hands-on experience in the application of his expertise. As a consultant, he has worked closely with state and federal agencies on numerous occasions, as well as with members of the private sector. Representative work includes:

- ⊖ Making Section 10 and Section 404 jurisdictional determinations using both field and remote sensing methodology
- ⊖ Reviewing and developing regulatory programs and procedures
- ⊖ Developing evidence for litigation
- ⊖ Coordinating and preparing expert witnesses for testimony

- € Problem solving and negotiating during environmental authorization processes with the Corps, U.S. Fish and Wildlife Service (ESA Sections 7 and 10(a)), National Marine Fisheries Service (ESA Sections 7 and 10(a) / EFH), U.S. Environmental Protection Agency, U.S. Coast Guard, State Lands Commission, San Francisco Bay Development and Conservation Commission, California Department of Fish and Game, and the State Water Resources Control Board and Regional Boards
- € Preparing and reviewing wetlands mitigation and restoration plans
- € Performing or reviewing assessments of wetlands values and impacts
- € Constructing aquatic and wetland habitats for mitigation
- € Providing evaluation and permitting for various types of development projects.

Dr. Huffman has provided his services for all types of projects, including residential, commercial, and industrial development; resort development; transportation; farming operations; telecommunications; aviation; aggregate mining; gas pipeline and electric transmission line construction; hydroelectric power; marine shipyard; dredging; and merchant power development.

INTRODUCTION

The purpose of this testimony is to provide information regarding the status of the U.S. Army Corps of Engineers (Corps) authorization for impacts to Waters of the United States, including wetlands and Navigable Waters.

REVIEW OF PROJECT

PROJECT DESCRIPTION

The Sacramento Municipal Utility District (SMUD), 6201 S Street, Sacramento, CA 95817, is proposing to construct the Cosumnes Power Project (CPP), which would include a nominal 1,000 MW natural gas-fired, combined cycle facility, using cooling tower technology. Electricity generated by CPP would be transmitted over 0.4 miles of new 230kV double-circuit transmission line from the on-site switchyard to the existing switchyard at Rancho Seco. Plant cooling water for Phase 1 would be supplied from the American River, delivered by the Folsom-South Canal. Fuel for the natural gas-fired turbines would be piped through a new 26-mile natural gas line located between the project site and the Carson Ice-Gen Cogeneration Facility, also located in Sacramento County. An approximate 20-acre construction laydown and parking area, located south of the proposed CPP site, south of Clay East Road is proposed by SMUD. SMUD proposes to revegetate the laydown area after construction is complete.

AREA DESCRIPTION OF PROJECT ELEMENTS

Power Plant Site and Laydown Area: The proposed CPP project site is located approximately 0.5 miles south of the Rancho Seco Nuclear Plant (currently undergoing decommissioning), 25 miles southeast of the City of Sacramento, in Sacramento County. The site consists of approximately 30 acres of an overall 2,480-acre site owned by SMUD. Aside

from the Rancho Seco Nuclear Plant located about a half mile to the north, the CPP site is in a rural area dominated by grazing, vineyards, and scattered rural homes. The Sierra Nevada foothills are located approximately 15 miles to the east. The project site slopes gently from south to north. Site elevation ranges from 140 to 160 ft above mean sea level.

Natural Gas Pipeline: The proposed 26-mile long natural gas pipeline would connect with the end of SMUD's gas line at the Carson Ice-Cogeneration power facility in Elk Grove and would proceed south and east to the CPP. Most of the route would be constructed adjacent to and within existing railroad and transmission rights-of-way, and roadways (Franklin Road, Core Road, Arno Road, Valensin Road, Laguna Road, Twin Cities Road, and Clay East Road).

The gas pipeline route goes through annual grassland in the Sacramento Regional Wastewater Treatment Plant bufferlands (2,500-acre buffer between the regional wastewater treatment facility and populated areas), and then ruderal grassland paralleling the Union Pacific railroad tracks on the west side. The alignment follows the railroad tracks through an agricultural area to Core Road and heads east to Bruceville Road. It then continues east through irrigated pasture to Eschinger Road and follows that to an unimproved farm road. It then turns south and crosses the Cosumnes River, Badger Creek, and a riparian area using HDD technology, and through the Cosumnes River Preserve. After crossing under State Route (SR) 99, the pipeline alignment continues east along Arno Road to Valensin Road, crosses Laguna Creek (using HDD technology), continues along Laguna Road to Twin Cities Road, and then to Clay East Road before ending at the plant site.

Most of the area east of SR 99 consists of agricultural areas that include irrigation canals and other wetland features. Crops include corn, alfalfa, vineyards, and irrigated pasture.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Clean Water Act of 1977: Title 33, United States Code, section 404 et seq, requires authorization from the Secretary of the Army, acting through the Corps of Engineers, for the discharge of dredged or fill material into all Waters of the United States, including wetlands, both adjacent and isolated. Discharges of fill material generally include, without limitation: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; dams and dikes; artificial islands; property protection or reclamation devices such as riprap, groins, seawalls, breakwaters, and revetments; beach nourishment; levees; fill for intake and outfall pipes and subaqueous utility lines; fill associated with the creation of ponds; and any other work involving the discharge of fill or dredged material. A Corps permit is required whether the work is permanent or temporary. Examples of temporary discharges include dewatering of dredged material prior to final disposal, and temporary fills for access roadways, cofferdams, storage and work areas.

Rivers and Harbors Act of 1899: Title 33, United States Code, section 403 et seq., requires authorization from the Secretary of the Army, acting through the Corps of Engineers, for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable Waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, rechannelization, or any other modification of a navigable water of the United States, and applies to all structures, from the smallest floating dock to the largest commercial undertaking. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g. riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction.

STATE

Regional Water Quality Control Board Certification: Federal Clean Water Act section 401 requires water quality certification from the state for the discharge of dredge or fill material into Waters of the United States. The Regional Board provides state 401 certification after reviewing the U.S. Army Corps of Engineers permit if it determines that established discharge requirements can be met by the proposed project.

EVIDENCE

In addition to the statements herein, this testimony includes by reference the following documents submitted during this proceeding:

CH2M Hill. 2003. *Jurisdictional Waters of the U.S., Report for the Cosumnes Power Plant, Sacramento County, California*. Prepared for Sacramento Municipal Utility District. February 7. 2 vols. Filed with the docket office on May 6, 2003.

CH2M Hill. 2003. *Sacramento Municipal Utility District, CPP Wetland Delineation Map Book* (showing natural gas pipeline alignment between Carson Cogen Facility and Cosumnes Power Plant Site). Tiles 1 through 56. February 5. Filed with the docket office on May 6, 2003.

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Sacramento Municipal Utility District. 2003. Section 404 Clean Water Act and Section 20 Rivers and Harbors Act Application for Cosumnes Power Plant, Sacramento County, California (Ref 200100710) April 23, 2003. Filed with the docket office on May 5, 2003.

This testimony also includes by reference the following laws, regulations, guidance documents, published professional papers, reports and texts:

Title 33, *Code of Federal Regulations* (33 CFR), Part 328. U.S. Government Printing Office, Washington, D.C.

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U.S. Army Corps of Engineers. 1992a. "Regional Interpretation of the 1987 Manual." Memorandum. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. February 20.

U.S. Army Corps of Engineers. 1992b. "Clarification and Interpretation of the 1987 Manual." Memorandum. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. March 8.

U.S. Army Corps of Engineers, Sacramento District. 2001. "Minimum Standards for Acceptance of Preliminary Wetlands Delineations." November 30.

U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 1995. *Hydric Soils of the United States*.

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TESTIMONY

U.S. ARMY CORPS OF ENGINEERS AUTHORIZATION

Permit Application: An application has been submitted by SMUD to the Corps of Engineers for Department of the Army authorization for the proposed CPP Project under Section 404 of the Clean Water Act of 1977 and Section 10 of the Rivers and Harbors Act of 1899. The application was prepared by Kleinschmidt Huffman-Broadway, Inc. (KHB) under my direction. The application has been accepted by the Corps and the Corps is currently preparing a Public Notice which will allow for public comment for a period of 45 days. Corps staff has indicated that the Public Notice will be released early May 2003.

Wetlands Delineation: As part of the Corps application process wetland delineation was submitted to the Corps by SMUD for official verification. The delineation was prepared by CH2MHill. CH2MHill, in addition to their own analysis relied on wetland delineations conducted at the power plant site and laydown area by Davis Environmental Consulting and preliminary wetland delineation work conducted by Jones and Stokes Associates, Inc. This delineation has been officially verified by the Corps. In addition I have reviewed the delineation report provided to the Corps and examined the wetland areas delineated within the power plant site, laydown area and natural gas pipeline route following the Corps 1987 Methodology and guidance documents. Based on this evaluation it is my professional opinion that the wetland delineation is accurate and that I am in agreement with the Corps official finding.

404(b)(1) Project Alternatives Analysis: In addition to the application and wetlands delineation submitted to the Corps a 404(b)(1) Project Alternatives Analysis has been submitted to the Corps by SMUD. This analysis was prepared by KHB under my direction in accordance with the U.S. Environmental Protection Agency's (EPA's) Guidelines, issued under Section 404(b)(1) of the CWA.

For the U.S. Army Corps of Engineers (Corps) to issue a permit under Section 404 of the federal Clean Water Act (CWA), it must make a finding that the proposed project complies with EPA's Guidelines. Central to EPA's 404(b)(1) Guidelines is a hierarchical approach designed to avoid and/or minimize impacts to wetlands and other Waters of the United States. Applicants are required to avoid impacts where possible, minimize impacts that cannot be avoided, and compensate for any remaining impacts that can neither be avoided nor minimized to an insignificant level.

The Sacramento Municipal Utility District (SMUD) has designed its Cosumnes Power Project (CPP) in accordance with this approach, with the result that impacts to federally regulated wetlands and other Waters of the United States have been avoided to the maximum extent practicable and minimized where avoidance was not possible. SMUD's analysis of its avoidance and minimization options (i.e., alternatives analysis) is presented below. A mitigation plan to compensate for impacts that can neither be avoided nor minimized to an insignificant level will be submitted to the Corps in accordance with the Corps guidelines under separate cover.

Alternative Sites: The Guidelines state that ". . . no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."¹ An alternative is considered practicable ". . . if it is available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposes."²

SMUD's overall project purpose is to restore the electric generating capacity at its Rancho Seco facility in order to provide additional generation and critically needed voltage support using existing or nearby critical infrastructure (e.g., the existing switchyard and appropriately sized water conveyance and storage facilities and transmission lines with unused capacity) by constructing a gas generating facility to serve impending electricity load needs from within the SMUD service area. Although this project purpose (the restoration of electric generating capacity at an existing facility) does not lend itself to off-site alternatives, SMUD and the California Energy Commission (CEC) staff examined five alternative sites during the course of the ongoing CEC licensing process.³ Those sites included the:

1. Proctor & Gamble Site;
2. Campbell's Soup Site;
3. Carson Ice-Generation Facility;

¹ 40 CFR § 230.10(a).

² *Id.* 230.10(a)(2).

³ The Corps' generally gives deference to state/local decision-making processes. *See* 40 CFR § 325.2(a)(6) ("If a district engineer makes a decision on a permit application which is contrary to state or local decisions, the district engineer will include in the decision document the significant national issues and explain how they are overriding in importance.")

4. Lodi Site; and
5. Woodland Site.

In accordance with the 404(b)(1) Guidelines, each of these sites was compared against the cost, existing technology and logistical criteria inherent in the overall project purpose.

As an initial screening criterion, 30 – 35 acres of land was considered necessary for the proposed power plant and appurtenant structures, plus a nearby laydown/parking area to be used during construction. Although the Proctor & Gamble and Campbell's Soup sites exhibited some of the infrastructure needed for the project, the available land at those sites (5 acres at Proctor & Gamble and 10 acres at Campbell Soup) was not sufficient and, therefore, they were eliminated from further consideration. The other three sites were examined in more detail. All three of the remaining sites were located entirely within 100-year floodplains. In addition to the very high cost of protecting the proposed facility from a 100-year flood, the flood protection measures (elevated foundation or perimeter berm) may not protect the facility from a greater than 100-year flood. Because of its size, the proposed power plant will be a critical element in SMUD's power supply system and the loss of its generating capacity during a major flood event would pose a significant risk to public safety.

Alternative Laydown/Parking Areas: In addition to power plant locations, SMUD considered three possible laydown/parking areas: (1) a remote location on the northeast part of the SMUD property (NE1); (2) an area immediately west of the proposed power plant site and north of Clay East Road (W1); and (3) the proposed laydown/parking area immediately south of the power plant site, across Clay East Road (S1).

NE1 is approximately 1.4 miles by road from the CPP site. If used as a primary laydown/parking area, SMUD has determined that it would have to institute 24-hour security to guard high-value plant components and incur the cost of moving those materials longer distances and transporting construction personnel at the start of a shift. SMUD engineers calculated the added costs associated with using NE1 as the laydown/parking area at \$6.9 to \$13.1 million.

Areas W1 and S1 are on opposite sides of Clay East Road (north and south sides, respectively). Because they are both close enough to the power plant to overcome the cost and logistical problems of NE1, they were compared with each other based on environmental and related criteria. W1 and S1 each support similar resource values and would have similar impacts if used as laydown areas. Based on observations of biological value, potential for erosion, water quality maintenance, visual and noise impacts, it appears that there are fewer impacts of using S1 than W1.

Pipeline Routes: Four alternative gas pipeline alignments were examined for the CPP project:

- € Carson Cogen Southwest Corridor
- € Carson Cogen Northeast Corridor (Carson East along Sheldon Road to east of Bradshaw, crossing Deer Creek, the Cosumnes River, Badger creek along the Central Traction Railway, South to Laguna Road, and east on the proposed corridor)

- € Proctor & Gamble Southwest Corridor (From the Proctor & Gamble facility southeast along California Traction Railway, east along Florin Road, across Fry creek, and Laguna Creek, south parallel to the Folsom South Canal, across tailing ponds, across Badger Creek, across four forks of Laguna Creek, Hadselville Creek and along Twin Cities Road to Rancho Seco)
- € Proctor & Gamble Southeast Corridor (From Proctor & Gamble Southeast along the California Traction Railroad, cross north fork Laguna Creek, North Fork Deer Creek, Deer Creek, Cosumnes River, north fork Badger, Badger and Laguna before following Twin Cities Road to the site)

After consulting with the U.S. Fish & Wildlife Service and California Energy Commission Staff, the Carson Cogen Southwest corridor was identified as having environmental impacts that were most easily avoided through micro-alignment changes.

Conclusion: Based on the factors outlined above, I determined that the proposed CPP Project is the least damaging practicable alternative, as that term is defined in the 404(b)(1) Guidelines. The selected power plant site was the only alternative that allowed the facility to be constructed outside a 100-year floodplain, and the selected laydown/parking area minimizes environmental impacts through avoidance of wetlands where possible. Moreover, the selected pipeline route will only result in temporary impacts. Direct impacts to streams along the right-of-way and the Cosumnes River and associated nature preserve will be avoided by jack-and-bore or horizontal directional drilling at those locations.

Wetland Impacts:

Based on the Corps approved delineation it was determined following the EPA 404(b)(1) guidelines for avoidance and minimization of project impacts to wetlands that both temporary and permanent fill impacts to wetlands/ Waters of the United States will occur if the CPP is authorized. These impacts are described as follows:

Pipeline Right-of-Way (temporary impacts): Temporary impacts along the pipeline right-of-way would be 1.723 acres, including 0.018 acre of rivers and streams, 0.106 acre of freshwater marsh, 0.185 acres of seasonal swales, 0.904 acres of seasonal wetlands, and 0.510 acres of drainage ditches. The seasonal wetlands acreage includes a single ponded feature (0.011 acres) determined by the Corps to be jurisdictional and 0.893 acres of seasonal wetlands. No permanent impacts to wetlands or other waters of the United States will occur along the pipeline right of way.

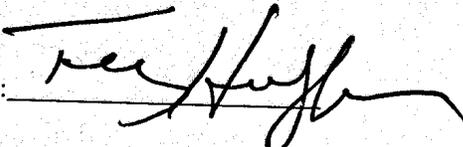
Power Plant Site (temporary impacts): Temporary impacts at the power plant site would be 1.194 acres, including 0.110 acre of perennial stream, 0.029 acres of seasonal stream, 1.028 acres of seasonal wetland, and 0.027 of vernal pools.

Power Plant Site and Laydown/Parking Area (permanent impacts): Permanent impacts at the power plant site and laydown/parking area would be 1.307 acres, including 0.352 acres of streams, 0.285 acres of freshwater marsh, 0.088 acres of vernal pools, 0.455 acres of seasonal swales, and 0.127 acres of seasonal wetlands.

Compensatory Mitigation:

Under the Corps Regulatory Program pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 compensatory mitigation is required to replace aquatic resource functions unavoidably lost or adversely affected by authorized activities. Permittees are required to provide appropriate and practicable mitigation for authorized impacts. The amount of mitigation in terms of mitigation acreage will be determined during the Corps decision making process in consideration of public and agency comment and the applicant's proposed mitigation approach or plan. SMUD has determined that the most appropriate and practicable way to compensate for unavoidable impacts to aquatic resource functions associated with Waters of the United States., including wetlands is through the purchase of mitigation credits from a Corps approved wetlands mitigation bank. The goal of this mitigation approach is to replace aquatic resource functions unavoidably lost or adversely affected by the CPP Project. Based on my experience and familiarity with the aquatic resources found associated with the wetlands/ Waters of the United States impacted by the CPP Project it is my professional opinion that this approach will result in the replacement of aquatic resource functions unavoidably impacted by the project.

To the best of my knowledge, all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

Dated: May 5, 2003 Signed: 

At: San Kspu, CA

MEMORANDUM

TO: File

FROM: Terry Huffman *TH*

DATE: May 1, 2003

SUBJECT: Memorandum of personal conversation between Terry Huffman, Ph.D., and Michael Finan, U.S. Army Corps of Engineers, Sacramento District, confirming Corps Verification of wetlands delineation submitted by SMUD.

On May 1, 2003, I spoke with Michael Finan, Chief, Regulatory Office, Delta Branch, U.S. Army Corps of Engineers, Sacramento District, at his office in Sacramento. I asked him if the Corps had officially determined the extent of jurisdictional wetlands at the Cosumnes River Power Plant site, laydown area, and pipeline route. He stated that the Corps had verified the wetlands delineation submitted by SMUD.

BIOLOGICAL RESOURCES

I. Introduction

A. Name

Paul Olmstead

My qualifications are summarized in the attached resume (Appendix A)

B. Prior Filings

This testimony includes by reference the following Biological Resources documents submitted in this proceeding:

- Biological Assessment for the Cosumnes Power Plant, (Sections 2B, 3B, 4B, 5B, 6B and 7B and Appendix D), filed as Response to Data Request 201 as BR-201B8 on April 4, 2003.
- Letter from National Marine Fisheries Service dated March 17, 2003.

To the best of my knowledge, all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

II. Summary

The Biological Assessment contains various conservation measures to protect fisheries resources. Project design and implementation of these conservation measures will ensure that the facility will be in compliance with the applicable federal, state, and local laws, ordinances, regulations, and standards (LORS) and any potential impacts to fisheries resources will be mitigated to a level of insignificance.

III. Declaration

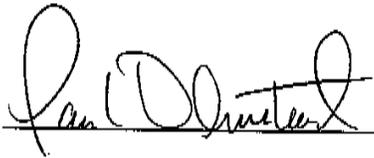
I, Paul Olmstead, declare as follows:

1. I am presently a Water and Power Resources Specialist at the Sacramento Municipal Utilities District.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare and supervised the preparation of the fisheries portion of the Biological Assessment and associated Appendix based on my professional experience and knowledge.

- 4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed herein.
- 5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 5, 2003

Signed: 

At: Sacramento, CA

APPENDIX A

Resumes

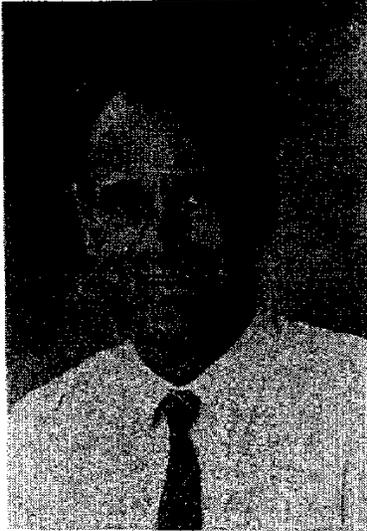
SMUD EXECUTIVE PROFILE

Sacramento Municipal Utility District

P.O. Box 15830

Sacramento, CA 95852-1830

Media Services
(916) 732-5111



Colin Taylor

Director of Projects Development

Colin Taylor joined SMUD as Director of Projects Development in August 1991. He manages the development and implementation of SMUD's resource acquisition program, including construction of new generation and transmission resources to meet the district's energy and power requirements.

Prior to SMUD, Taylor was project development manager for ABB Combustion Engineering/Energy Ventures of New Jersey since 1985. Most recently, he managed the development of two major power generation facilities in Asia. He directed the construction and start-up of a \$100 million NEPCO cogeneration facility in Pennsylvania, and a 27 megawatt cogeneration facility at the University of California, Berkeley.

Throughout his career, Taylor has been responsible for the development, design, construction and startup of power generation plants including cogeneration, gas turbine, wood burning boilers and other technologies. While working for Kaiser Aluminum, Taylor managed the design of a 100 megawatt powerhouse for an alumina plant in Indonesia and a large industrial boiler facility in Louisiana. With Daniel International, Taylor controlled the construction engineering and scheduling of a 600 megawatt coal-fired power plant in Ohio. Also with that company, Taylor directed project construction engineering on a coal-fired power plant in Georgia. With the Central Electricity Generating Board in England, he worked on projects involving operation and maintenance of a nuclear power plant and the conversion of a coal-fired power plant.

Taylor received his diploma in Mechanical Engineering (the equivalent of a bachelor's of science degree) from Brighton College of Technology in England. He is a Registered Mechanical Engineer in England, where he also earned the titles of M.I. Mech. E. and C.E., which are the the equivalents of certification as a Professional Engineer in the United States.

January 1993

EDUCATION	Bachelor of Science – Mechanical Engineering California Polytechnic State University, San Luis Obispo
REGISTRATION	Professional Engineer Licenses California Mechanical Engineer # M 27338 Louisiana Mechanical Engineer # E-25802
SUMMARY	Served as Licensing Project Manager for 7FA combined cycle power plant and gas pipeline extension. Experience with local, state, and federal agencies, permits, and staff, including USACOE, USFWS, NMFS, SMAQMD, Sacramento County Planning Department and CDFG. Familiar with codes and standards used for plant and pipeline design and compliance, including the UBC, CBC, UMC, UPC, UFC, and Codes and Standards produced by the ASME (B31.1, B31.3, B31.8, B&PV Code Sections I, V, VIII, and IX), ANSI, NFPA, AWWA, AWS, AISC and 49 CFR 192. Served as designer, supervisor, manager, and lead principal engineer with various firms. Performed design and design review functions for power plants, refineries, chemical plants, stadiums, schools, aboveground and underground pipelines, rocket engine test stands, and space launch complexes. Assisted firms and agencies to achieve regulatory compliance in process safety management, risk management, and hazardous materials systems and processes. Certified for ten years as a visual and UTT inspector in accordance with ASNT-SNT-TC-1A. Served as a volunteer participant and voting member of the ASME Boiler and Pressure Vessel Code Committee for five years. Publications and presentations include California Boiler Inspectors Association Conference, NASA/DoD Conferences, and Petro-Safe Conferences.

REPRESENTATIVE PROJECT EXPERIENCE	COSUMNES POWER PLANT – 1,000 MW SACRAMENTO, CALIFORNIA ~ 2000 to Present Currently Licensing Project Manager for the SMUD Cosumnes Power Plant and Pipeline Extension Application for Certification (AFC). Responsible for schedule, budget, and technical accuracy of the AFC. The plant is a 4 x 2 using GE 7FA CTGs and Mitsubishi STGs. Coordinated the preliminary engineering layout for the plant, switchyard and linear facilities, as well as the development of environmental documentation and mitigation plans. Assists with the CBO function, and developed the compliance matrix for the plant construction.
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INDEPENDENT ENGINEERING REVIEWS

Reviewed large private and public works projects for code compliance, completeness, and constructability. Projects for professional engineering firms prior to construction and CBO submittal ranged from \$2 million to \$700 million and include:

- € California Department of Corrections Delano II Prison ~ 2000 to 2001
Performed design reviews and code compliance assessments for the Delano II Prison. Ensured compliance with CDC requirements, siting, and security for mechanical equipment, steam plant, and sewer, water, and natural gas utilities.

- € Mesa Arts and Entertainment Center ~ 2000
Performed design reviews and code compliance assessments for the Mesa, AZ arts and entertainment complex. The \$100 million five-level center includes four public assembly theaters, museum, artist's center and central plant. Reviewed the project for code and ordinance compliance, with focus on sound attenuation for the mechanical and piping systems.

- € ASU Stadium Remodel ~ 2000 to 2001
Performed the design review and code compliance assessment for the ASU stadium complex. Work included extensive remodel and extension of the five-story business operations center. Verified the design of the HVAC system and central steam and power plant.

- € SJCC Northeast Quadrant Complex ~ 2000
Responsible for interdisciplinary coordination and review of site work for a college campus utilities and building project, and extension of a natural gas pipeline to the college's central plant.

- € UC Davis District Pipeline ~ 2000
Developed a budget and work plan for the campus-wide extension and replacement of two 24-inch cooling water underground pipelines. Responsible for reviewing site work, constructability, and utilities coordination.

CAMPBELL SOUP COGENERATION PLANT – 150 MW

SACRAMENTO, CALIFORNIA ~ 1994 to 1996

Supervised the engineering design and development of P&IDs, piping isometrics, loop and logic diagrams, and specifications for the piping and controls interconnection from the power plant to the existing boilerhouse serving the steam customer. Provided field engineering services during construction. Systems included main steam, boiler feedwater, natural gas, condensate return, and hot stand-by re-circulation. Code compliance with B31.1, B31.3, B31.8, UBC, UMC, and NEC.

SACRAMENTO WATER TREATMENT PLANT BOILER ROOM SACRAMENTO, CALIFORNIA ~ 1998 to 1999

Troubleshoot and analyzed the main steam system from the Carson

Cogeneration Facility host for temperature and steam supply modulation. Managed the steam supply relief system modification designs, and piping and structural analysis of main steam header modifications.

AIR FORCE RESEARCH LABORATORY, EDWARDS AFB, AND VANDENBERG AFB SPACE LAUNCH COMPLEXES ~ 1989 to 1999

Owner's engineer for the development of designs, design reviews, and performance of structural modifications to hypergolic, high pressure, steam and cryogenic systems. Performed ASME B31 and B&PV Code analyses focusing on thermal, seismic, impact load stability and safety.

PROCESS SAFETY AND RISK MANAGEMENT COMPLIANCE, VARIOUS PROJECTS ~ 1992 to 2000

Performed plant design reviews, and compliance assessments. Developed programs and engineering procedures to bring refineries and chemical plants into compliance with OSHA's 29 CFR 1910.119 and EPA's 40 CFR 68.

VARIOUS NUCLEAR POWER PLANTS ~ 1986 to 1989

Various PWR and BWR nuclear power plants including Trojan, Peach Bottom, Turkey Point, Sequoyah Unit II, and Watts Bar. Performed piping and structural code analysis, design, and modifications using ASME Section III, UBC, AISC, and ASME B31.1 codes and standards.

Employer History

Bechtel Power Corporation ~ 1986 to 1989

General Physics Corporation ~ 1989 to 2000

Kitchell CEM ~ 2000 to 2001

Integrated Engineers and Contractors Corporation ~ 2001 to 2003

Sacramento Municipal Utility District ~ 2003 to present

SUSAN STRACHAN

Susan Strachan has 18 years of project management experience in the permitting and compliance activities associated with large industrial projects. She has extensive experience permitting power plants under the jurisdiction of the California Energy Commission, providing environmental project management and compliance services for 14 projects before the Commission in the last 11 years. Her experience includes preparing permit applications, negotiating permit conditions, development of compliance plans, and managing compliance activities.

EDUCATION

B.A., Political Science
University of California, Santa Barbara

PROFESSIONAL HISTORY

Consultant - Environmental Project Manager
June 1998-Present

Sacramento Municipal Utility District
Mgr., Project Permitting and Licensing - March 1992-May 1998

Assemblymember Lloyd Connelly

SENIOR ASSISTANT - 1990 TO 1992

Santa Barbara County
Hazardous Materials Section Manager - 1987 to 1990
Environmental Planner 1985 to 1987

PROFESSIONAL - EXPERIENCE

Sacramento Municipal Utility District Cogeneration Projects

Ms. Strachan served as the Manager, Project Permitting and Licensing, responsible for overseeing all permitting activities before the California Energy Commission for the following projects:

- € Sacramento Cogeneration Authority at Procter & Gamble
- € Sacramento Power Authority at Campbell Soup
- € Carson Ice-Gen
- € SEPCO
- € SMUD Cogeneration Pipeline

In this position, Ms. Strachan worked closely with the California Energy Commission while the projects moved through the licensing process. Her responsibilities included preparation of the Applications for Certification, responding

to data requests, negotiating permit conditions, working with members of the public, and participating in hearings.

Ms. Strachan was also responsible for acquiring permits from other agencies including the Sacramento Metropolitan Air Quality Management District, Regional Water Quality Control Board, U.S. Fish and Wildlife Service, and Army Corps of Engineers.

SMUD's Sacramento Power Authority Cogeneration Project at Campbell Soup – Compliance As project manager, Ms. Strachan managed the compliance activities associated with the California Energy Commission's conditions of certification for the project. This included interface with the California Energy Commission during construction of the project, preparation of submittals to the CEC in compliance with permit conditions, and preparation of amendments for proposed changes to conditions of certification. Ms. Strachan was also responsible for responding to and addressing local community concerns associated with the project.

SMUD's Cosumnes Power Plant – Ms. Strachan's role on this project is to provide environmental project management support/advice to SMUD for the California Energy Commission licensing of the project.

Calpine Corporation – Since 1998 Ms. Strachan has been working with Calpine Corporation as the Environmental Project Manager for several natural gas-fired power plants in California. These include the following:

- € Delta Energy Center (880 MW, licensed 2000)
- € King City LM600 Project (50 MW, licensed 2001)
- € Gilroy City Phase I LM6000 Project (135 MW, licensed 2001)
- € East Altamont Energy Center (1100 MW, currently in permitting)

Her responsibilities have included obtaining the California Energy Commission licenses for the projects and obtaining permits from other regulatory agencies such as the U.S. Fish and Wildlife Service, California Department of Fish and Game, State Lands Commission and U.S. Bureau of Reclamation.

Calpine Corporation – Compliance Ms. Strachan has also assisted Calpine Corporation in compliance activities

associated with projects licensed before the California Energy Commission. Her activities have included the preparation of several amendments to the project licenses for the Delta Energy Center and Los Medanos Energy Center.

Calpine Corporation – Due Diligence Ms. Strachan conducted the environmental due diligence investigation for Calpine's acquisition of the Los Medanos Energy Center and Otay Mesa projects.

Modesto Irrigation District - Ms. Strachan provided Environmental Project Management services to the Modesto Irrigation District for the Woodland 2 Generation Station, an 80 MW combined cycle power plant, currently in construction. She is currently managing the permitting of the Modesto Irrigation District Electric Generation Station, a 95 MW simple-cycle power plant. Her responsibilities include: managing the preparation of the application, providing project coordination with the California Energy Commission, and resolving issues/concerns of the California Energy Commission. Ms. Strachan also prepares CEC amendments for the Woodland 2 project.

Turlock Irrigation District – Ms. Strachan is providing Environmental Project Management Services to the Turlock Irrigation District for its Walnut Energy Center, a 250 MW power plant. Her responsibilities include: overseeing the preparation of the application to the CEC; participating in public outreach activities; assisting in the organizing of the CEC's Information Hearing and a TID sponsored Open House; responding to Data Requests; reviewing the Preliminary and Final Staff Assessments; preparing for and participating in Evidentiary Hearings.

Erik Jens Koford
Senior Biologist/ Project Manager

Education

M.S., Ecology, University of California, Davis, 1987
B.A., Zoology, University of California, Berkeley, 1977

Professional Registrations

Certified Wildlife Biologist, The Wildlife Society, 1990
Certification for Hazardous Waste Operations, 1989--1999
Certification for Hazardous Waste Site Managers, 1989
Habitat Evaluation Procedures (HEP)
Wetland Delineation Training 1999

Distinguishing Qualifications

- € Prepared technical analysis for many EIRs, EIS and environmental permits for natural gas-fired power plants, hydroelectric facilities, gas pipelines, general plans, master plans, military bases, and landfills.
- € Deputy Project Manager for 3 recent Applications for Certification for gas-fired power plants.
- € Task Manager for controversial 500 kV Transmission Line Environmental Assessment for BLM in Las Vegas.
- € Project manager for complex Master EIR dealing with biosolids applications.
- € Performed threatened and endangered species survey for 12 species in 18 states and countries.
- € Demonstrated experience assessing and responding to concerns of local communities and federal agencies regarding hazardous waste and water quality issues.
- € Experienced negotiating Section 7, Section 10, 404 and 401 permits with USFWS, CDFG and RWQCB
- € Experienced with stakeholder involvement and negotiations with USFWS, CDFG, ACOE, NMFS, CEC, FERC, BLM, SWRCB, RWQCB, and Navy, Army and Air Force military installations.

Relevant Experience

Mr. Koford has more than 18 years of experience in preparing environmental permitting documents, wildlife and fisheries investigations, threatened and endangered species surveys, EIS/EIRs, water quality evaluations, and environmental regulatory compliance with requirements of CEC, FERC, SMARA, CERCLA, RCRA, NEPA and CEQA. He has

performed field surveys in 18 states and countries. He has consistently assisted clients in developing creative solutions to potential environmental problems affecting wildlife and water quality.

Representative Projects

Market Segment: Power Plant/Energy Systems Permitting

Environmental Assessment for 500 kV Transmission Line for Mirant Apex Energy Facility, Las Vegas, NV. Task manager to prepare complex EA for transmission project crossing Bureau of Land Management Lands. Project involved typical biological, water quality, and land use issues but was greatly complicated by cumulative impacts requirements and rapidly changing requirements from BLM. Required frequent close coordination, relationship development, facilitation and assistance to both clients (Mirant, Gen West Power) BLM and state and local agencies. Also required permits or waivers from USFWS, ACOE, Nevada Department of Wildlife, Nevada Department of Transportation, Nevada Division of Forestry, Clark County, and Nevada PUC for UEPA.

Application for Certification for Cosumnes Power Plant, Sacramento, California. Deputy Project manager to prepare AFC and supporting studies for 1,000 MW natural gas-fired power plant and 26-mile gas pipeline to be located near existing Rancho Seco Nuclear Facility. Project was highly controversial because it proposed to use high quality surface water for cooling. Project involved pipeline siting assistance, biological surveys for Swainson's hawk, giant garter snake, tiger salamander, burrowing owls, tri-colored blackbirds, wetlands delineations, hydrological analyses and rare plant surveys as well as water quality analysis to support NPDES permit for industrial discharges to surface water to Clay Creek. Pipeline included permitting for 3 water crossings by horizontal directional drilling. Project required permitting under Section 404 (wetland fill), Section 401 (water quality waiver), US FWS Section 7 (Incidental take), Fish and Game Code Section 2081(incidental take), and Section 1603 Streambed Alteration Agreements. Project was complex, controversial, requiring interagency coordination and expert witness testimony.

Application for Certification for Los Esteros Critical Energy Facility, San Jose, California. Task manager for biological resources for AFC supporting natural gas-fired power plant located in northwest San Jose, California. Required assessments for burrowing owl, red legged frog, impacts of NOx on serpentine communities and nitrogen fallout. Project required wetland delineations in Coyote Creek channel, negotiations with Army Corps of Engineers, California Department of Fish and Game, Santa Clara Valley Water District and testimony before California Energy Commission to permit stormwater outfall. Project involved elaborate compensation program involving off-site trees, acquisition, monitoring and maintenance of

Application for Certification for East Altamont Energy Center, Tracy California. Deputy project manager to prepare AFC for 1,100 MW natural gas-powered electricity center to be located near Tracy, California. Task leader for wildlife and water quality, Biological Opinion, Section 2081 and Section 404 permitting as well as team coordination, budget-tracking, and quality control.

Application for Certification for San Joaquin Energy Facility, Fresno, California. Deputy project manager to prepare AFC for 1,100 MW natural gas-powered power plant near Fresno. Task leader for wildlife and water quality as well as team coordination, budget-tracking, and quality control.

Application for Small Power Plant Exemption (SPPE) for Woodland Generation Station II, Modesto, California. Prepared SPPE for natural gas-fired power plant on developed site. Project included biological surveys and analyses for 6-mile gas pipeline, biological monitoring and compliance.

Application for Certification for 3 Natural Gas-fired Energy Facilities, to be co-located with PG&E substations in San Mateo, Santa Clara, and San Francisco. Deputy project manager responsible for preparing water, biology, soil and agricultural resources sections of 3 AFCs on expedited schedule. Special legislation required preparation of 3 major documents in 15 days. As deputy PM was responsible for proposal, costing, scheduling, team management and direction, as well as project execution within the required time.

Feasibility Analysis, including NEPA Compliance, Water Supply and Biological Constraints for Potential Cogeneration Sites: Clark County and Washoe County, Nevada Calpine Corp.. Project Manager to identify necessary permits under NEPA, UDEPA, county, local and tribal jurisdictions, potential water supply issues, and constraints conferred by presence of state or federal endangered species. Project involved review and advice on modifications and strategic approach to permitting proposed power plants.

Biological Constraints Analysis and Strategic Permitting Support for Three Potential Central Valley Power Plant Sites (Tracy, Lathrop, Lodi). Calpine Corp. Prepared biological constraints analysis, field surveys and permitting advice for potential cogeneration facilities in Central Valley. Included wetlands, endangered species, water quality, water supply and compliance issues.

Application for Certification (AFC) of Metcalf Energy Center Cogeneration Project; San Jose, California. Calpine Inc.. Prepared responses to additional comments from intervenors and CEC with respect to biological and water quality issues. Prepared supplemental environmental analyses for West End Access Road and Project Linears, Water Supply, erosion control and drainage plans. Provided strategic advice and assistance on mitigation measures for Bay Checkerspot butterfly and serpentine habitat. Application prepared for submission to California Energy Commission.

Stockton Cogeneration Plant and Supplementary EIR, Air Products Corporation, Stockton, California. Wildlife assessment and survey and project review for potential impacts to public health, water quality, fish and wildlife resources of cogeneration facility discharges. Primary author of SEIR. Analyzed fish, wildlife and threatened and endangered species impact of cooling tower discharges for supplementary EIR. Involved field surveys, literature research, documentation and toxics analysis.

Threatened and Endangered Species Surveys for New Transmission and Gas Line Corridors, Sacramento Municipal Utility District, Sacramento County, California. Performed threatened and endangered species surveys of 80 miles of alternative new utility

corridors in Sacramento and Yolo Counties. Located occurrences of state protected species including giant garter snake, Swainson hawk, tri-colored blackbird, and vernal pool invertebrates (i.e. *Branchinecta*, *Lindleriella*, and *Lepidurus*).

NPDES Permit Preparation, Campbells Soup Cogeneration Facility, Sacramento Municipal Utility District, Sacramento, California. Prepared threatened and endangered species surveys for new transmission and gas line corridors.

Application for Certification (AFC) of Sutter Ethanol Cogeneration Project, Ark Energy Group, Rio Linda, California. Performed threatened and endangered species surveys and wildlife impact evaluations for proposed ethanol production plant. Wrote mitigation plan for burrowing owl and Swainson's hawk. Researched and evaluated problems of groundwater supply and quality, stormwater drainage, wastewater treatment and disposal (evaluated irrigation, surface water disposal and deep well injection), and FEMA and county requirements for construction in the 100-year floodplain. Evaluated multiple sites for preferred siting. Application prepared for submission to California Energy Commission.

Application for Small Power Plant Exemption (SPPE) for Ice Plant-Cogeneration Facility, Sacramento Regional Wastewater Treatment Plant, Carson Energy Group, Sacramento, California. Performed threatened and endangered species surveys and wildlife impact evaluations for proposed plant. Wrote burrowing owl and Swainson's hawk mitigation plans. Researched and evaluated problems of municipal and groundwater supply and quality, storm water drainage, sewer use permit and FEMA and county requirements for construction in the 100-year floodplain. Application prepared for submission to California Energy Commission.

Cogeneration/Desalination Project, Mission Energy Company, Glenwood Springs, Colorado. Responsible for assessing biological impacts, including T&E species, wildlife, non-game species, critical habitat avoidance and mitigation for cogeneration/desalination project that included transmission line routing and environmental assessment. Included extensive agency consultations/coordination and field surveys.

Market Segment: Water Quality

Stockton Cogeneration Plant and Supplementary EIR, NPDES Permits, Air Products Corporation, Stockton, California. Water quality assessment and survey and project review for potential impacts to public health, water quality, fish and wildlife resources of cogeneration facility discharges. Primary author of Supplemental EIR. Analyzed impacts to beneficial uses of cooling tower discharges for supplemental EIR. Involved field surveys, literature research, agency permitting, sampling, documentation and toxics analysis.

Technical Support for Bay-Delta Hearings, State Water Contractors, Sacramento, California. Evaluated effects of toxic substances in the Sacramento-San Joaquin Delta on striped bass.

Periphyton Studies on North Fork Stanislaus River, Northern California Power Agency.

As water quality and field leader, performed water quality analyses using field spectrophotometer, and acted as field leader for distribution and collection of artificial substrates. Study objectives were to investigate causes of increased growth of noxious periphyton *Didymosphenia geminata* affecting North Fork Project operations.

State Water Resources Control Board Hearings, Payne, Thompson & Walker, Sacramento, California. Expert witness testimony for water quality impacts on wildlife and anadromous and resident fishes of the Lower Mokelumne River.

Lower Mokelumne Fisheries Study; California Department of Fish and Game. Collected, analyzed, and interpreted historical and current information on chinook salmon populations, habitat and management. Conducted microhabitat, population and habitat surveys, IFIM, integration of reports from CDFG, State Water Resources Control Board and Bureau of Reclamation, and report writing.

Our House Dam Monitoring, Yuba County Water Agency, California. Conducted fish and invertebrate population surveys in Middle Fork Yuba River to assess impact of sediments sluiced from a reservoir.

Hazel Creek Tunnel, El Dorado Irrigation District, California. Prepared water monitoring and sediment control plans to reduce hazards to fish and wildlife and to comply with Regional Water Quality Control Board requirements.

San Joaquin River Parkway Master Plan Program EIR, San Joaquin River Conservancy, California. Responsible for biological and water quality analysis. Issues included several endangered species, and extensive in-channel gravel mining.

Deer Creek Hills General Amendment EIR, Sacramento County Department of Environmental Review and Assessment, California. Responsible for biological and water quality analysis for 4,500-acre proposed rezone for residential development. Project was controversial in that it would affect a large area designated as a significant natural area in the general plan, was outside the designated Urban Services Boundary, and would use an innovative conjunctive use water system diverting water from the Cosumnes River. The Cosumnes is already over-allocated, and is the site of significant biological resources.



Debra Crowe Biology

Education

B.S., Environmental Biology and Management (Honors), University of California, Davis
Veterinary Technician Certification Program, Western Career College, Sacramento, California

Professional Registrations

Endangered Species Act (ESA) Section 10 Scientific Take Permit for California Threatened and Endangered Fairy Shrimp and Tadpole Shrimp (Permit #TE004824-0)

California Department of Fish and Game Scientific Collector's Permit

Certified Veterinary Technician

Distinguishing Qualifications

- € Experienced in California Energy Commission power plant licensing procedures
- € Expert witness for biological resource evaluations on power plant projects
- € Experienced in Section 7 of ESA consultations and mitigation plans
- € Expertise in biological resource construction mitigation monitoring
- € Routinely consults with natural resource agencies on project permitting, mitigation measures, and construction monitoring

Relevant Experience

Ms. Crowe is a wildlife and wetlands biologist who analyzes potential project impacts on biological resources, including wetlands and threatened or endangered species and Species of Concern. She has been an expert witness in several power plant licensing projects under the California Energy Commission regulations and prepared biological resource analyses, mitigation, monitoring, and resources management plans, and monitored construction and operations for compliance with Conditions of Certification. She conducts wetland delineations, biological resource surveys, timber stand exams, and wetland creation/preservation monitoring.

Representative Projects

- € **Application for Certification (AFC) of Metcalf Energy Center, Calpine Corporation, San Jose, California.** Task Manager for biological resource impact analysis and document section of AFC. Performed threatened and endangered species surveys, literature search, and wildlife impact evaluation for proposed electric power plant,

recycled water supply line, natural gas pipeline route, and electric transmission line connection. Prepared the biological resources section of the AFC.

- € **Environmental Impact Report/Environmental Impact Statement for Teayawa Energy Center, Calpine Corporation, Indio, California.** Task Manager for threatened or endangered species consultations with U.S. Fish and Wildlife Service and California Department of Fish and Game. Performed threatened and endangered species surveys, literature search, and wildlife impact evaluation for proposed electric power plant, recycled water supply line, natural gas pipeline route, and electric transmission line connection.
- € **Application for Certification (AFC) of Sutter Power Plant, Calpine Corporation, Yuba City, California.** Task Manager for biological resource impact analysis and document section of AFC. Performed threatened and endangered species surveys, literature search, and wildlife impact evaluation for proposed electric power plant, natural gas pipeline route, and electric transmission line route. Conducted wet season and dry season surveys for listed vernal pool branchiopod species. Conducted wetland delineation, prepared wetland delineation report, biological assessment, and mitigation plans for U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Department of Fish and Game, and California Energy Commission.
- € **Application for Certification (AFC) of Delta Energy Center, Calpine Corporation, Pittsburg, California.** Task Manager for biological resource impact analysis and document section of AFC. Performed threatened and endangered species surveys, literature search, and wildlife impact evaluation for proposed electric power plant, natural gas pipeline route, and electric transmission line route. Conducted wet season and dry season surveys for listed vernal pool branchiopod species.
- € **Application for Small Power Plant Exemption for Carson Ice-Cogeneration Facility, Sacramento Regional Wastewater Treatment Plant, Carson Energy Group, Elk Grove, California.** Assisted in the preparation of a Biological Resources Management Plan for the burrowing owl and threatened or endangered species at the project site. Served as assistant project manager for biological resource construction mitigation monitoring in vicinity of project site. Conducted surveys for threatened and endangered species, Species of Special Concern, and wetlands and other wildlife habitats.
- € **Application for Certification (AFC) of Sacramento Ethanol and Power Cogeneration (SEPCO) Project, Ark Energy Group, Rio Linda, California.** Performed threatened and endangered species surveys (giant garter snake, fairy shrimp, Swainson's hawk, burrowing owls), literature search, and wildlife impact evaluation for proposed ethanol production plant and water pipeline route. Assisted in vernal pool crustacean surveys on project site. Conducted wetland and raptor surveys for evaluation of impacts along proposed water pipeline route.

ELLYN MILLER DAVIS
Principal

Key Qualifications:

Ms. Davis has in-depth experience in and knowledge of natural resources planning and regulatory compliance. Her sixteen years experience as an environmental consultant has provided her with a solid working knowledge of environmental resource laws and regulations including Sections 404 and 401 of the federal Clean Water Act, Section 10 of the Rivers and Harbors Act, National Environmental Policy Act, Fish and Wildlife Coordination Act, Endangered Species Act, California Environmental Quality Act, and Section 1600 et seq. of the California Fish and Game Code.

Technical Expertise:

- € Wetland and Natural Resources Delineation, Planning, and Management Guidance
- € Wetland and Biological Resource Mitigation Planning and Construction Oversight
- € Habitat Restoration Design, Construction Management, and Mitigation Monitoring and Reporting
- € Permitting Assistance pursuant to Section 404 of the Federal Clean Water Act, Federal Endangered Species Act, and Section 1601-1607 of the California Fish and Game Code (Streambed Alteration Agreements)

Education:

M.E.M. in Environmental Management, Duke University, Durham, NC. 1986
B.S. in Botany, University of California, Davis, CA. 1984

Previous Professional Experience:

Environmental Scientist, Jones & Stokes Associates, Sacramento, CA. 1992-1998.

Wetland Regulatory Associate, Huffman and Associates, Inc. Sacramento, CA. 1990-1992.

Senior Biologist, Harding Lawson Associates. Novato, CA. 1989-1990.

Botanist, Western Ecological Services Company (WESCO). Novato, CA. 1986-1989.

Representative Project Experience:

Section 404 permitting and Endangered Species Act compliance; development of a natural resources mitigation and management plan, including wetland preservation and mitigation design, endangered species conservation, and recreation and open space management for the 4,800-acre **Twelve Bridges mixed-use development project** in Placer County, California. Construction coordination and technical performance monitoring for phased implementation of wetland mitigation.

State and federal wetland regulatory compliance assistance, wetland mitigation planning, implementation coordination, construction oversight, and mitigation monitoring for the 1,600-acre **Rancho Seco Golf Course and Master Plan project** in Sacramento County. Managed natural resources inventories, developed a wetland and endangered species mitigation plan, facilitated agency approvals of the necessary permits, provided construction oversight and conducted mitigation monitoring and reporting in compliance with permit requirements.

Riparian restoration implementation, performance monitoring, regulatory agency liaison, and management of regulatory compliance documentation for the **Tassajara Creek Riparian Restoration Project** in Alameda County, California. The project entailed preparation of bid specifications, construction monitoring for red-legged frog and regulatory compliance, federal and state permit acquisition, and management of restoration implementation for a one-mile reach of Tassajara Creek in Dublin for Alameda County Community Development Agency. In compliance with regulatory permits, annual performance monitoring, maintenance recommendations, and reporting to regulatory agencies was conducted for five years following project completion.

Professional Affiliations:

Association of Environmental Professionals
Society for Ecological Restoration
Society of Wetland Scientists

Publications and Presentations:

Davis, E.M. 2001. *Tassajara Creek Riparian Restoration Project: Integrating Water Quality Management in Urban Environments*. Presentation at the Turning the Tides Symposium. Oakland, CA. January 2001.

Davis E.M. 2001. Panel Moderator: Restoration Section. Annual Conference of the Western Chapter of the Wildlife Society. Sacramento, CA. February 2001.

Cylinder, P; K. Bogdan; E.M. Davis; and A. Herson. 1995. *Wetlands Regulation; A Complete Guide to Federal and California Programs*. Solano Press Books. Pt. Arena, California. 363 pages.

Guest Lecturer, University of California, Davis. May 1998. Environmental Geology and Land Use Planning Course.

Davis, E.M.; K. Bogdan; and R. Francisco. 1997. U.S. Army Corps of Engineers Releases New Nationwide Permits under Section 404 of the Clean Water Act. Environmental Update. February 1997. JSA, Sacramento, CA.

Program Organization and Panel Moderator - Conference on Mitigation Banking in California. 1995. *Wetland Mitigation Bank Planning, Financing, Designing and Permitting*. U.C. Davis Extension, Sacramento, California.

“Wetland Mitigation Planning and Implementation.” Paper Presented at the American Planning Association Annual Conference. San Francisco, California. 1994.

Program Organization and Panel Moderator - First Conference on Mitigation Banking in California. 1994. *Interest Group Perspectives on Mitigation Banking*. U.C. Davis Extension, Sacramento, California.

Davis, E.M.; K. Bogdan; and G. Sutter. 1994. Wetland Mitigation Banking: New State Law Provides Opportunity to Streamline Wetland Permit Process. Environmental Update. February 1994. JSA, Sacramento, CA.

Panelist on the Environmental Sciences Panel at the Western Regional Conference of the Association of Women in Science. Davis, California. 1994.

E.M. Davis and A. Rucker. 1993. "Lessons learned from large-scale riparian restoration projects". Pages 186-189 in *Riparian Management: Common Threads and Shared Interests*. USDA Forest Service General Technical Report RM-226. Fort Collins, Colorado.

PAUL OLMSTEAD

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Sacramento, CA 95821
(916) 481-5529

PROFESSIONAL SUMMARY

Twenty-eight years experience in project management, licensing, regulatory compliance, consultant management, and electrical utility, water storage, water management and transportation projects in both the private and government sectors.

PROFESSIONAL EXPERIENCE

WATER AND POWER RESOURCE SPECIALIST 1998 - present

Responsible for planning and negotiating with regulators and resource agencies regarding power, water use, water policy and environmental related issues. Represent the District in all activities and projects associated with the Central Valley Project including but not limited to the Central Valley Project Improvement Act, Restoration Fund, Anadromous Fish Restoration Program, Reclamation Long-term Water Studies, Trinity River Project, CALFED Bay-Delta Program and the CALFED Environmental Water Account. Administer the District CVP Water Service Contract. I negotiate with the Bureau of Reclamation on the Long-term Water Contract and operation / maintenance deficits related to the Central Valley Project.

District representative on the American River Water Forum, the American River Operations group and the CVPIA Restoration Roundtable.

Managing the environmental documentation to support the assignment of a portion of District Water Service Contract to the Sacramento County Water Agency.

SENIOR PROJECT MANAGER 1992 - 1998

Project Manger of the SMUD Wind Project. Licensed, permitted and managed construction, technical operation and maintenance activities for 5 MW Wind Project. Represented the District in negotiations with resource agencies, regional and national special interest groups and the general public. Certificate of Recognition from General Manager.

Assisted in California Energy Commission licensing activities for three SMUD cogeneration facilities and gas pipeline project.

DEMAND SIDE SPECIALIST 1990 - 1992

Assisted in creation of a SMUD Solar Program Plan and District Heating and Cooling program. Matrixed to Projects Development to conduct Transmission Line Analysis and

early licensing activities for SMUD Cogeneration and Pipeline Projects. Certificate of Appreciation from AGM.

ENVIRONMENTAL SPECIALIST 1984 - 1990

Responsible for planning and licensing activities needed to support acquisition, construction, modification and operation of electrical generation, transmission and distribution facilities.

Projects included: SMUD-Sierra Pacific Intertie Project, development of Electrical Facility Plans and permitting of bulk substations, overhead transmission /subtransmission facilities. District representative at Governing Boards and Planning Commissions.

SYSTEMS ENGINEER Electronic Data Systems 1983 - 1984

Project Team Leader for program development.

PROJECT PLANNER Consultant to Western Area Power Administration 1982 - 1983

Licensed transmission line projects and associated electrical facilities. Responsible for regulatory compliance, project scheduling and public involvement.

NATURAL RESOURCE SPECIALIST Bureau of Reclamation 1978 - 1982

Prepared environmental documentation / obtained permits and licensed reservoir, irrigation, wind energy and water management projects. Quality Increase Award from Regional Director for Outstanding Service.

MINING ENGINEER TECHNICIAN Bureau of Mines 1977

Evaluated environmental, economic and technical feasibility of domestic mining operations.

ENVIRONMENTAL BIOLOGIST Federal Highway Administration 1975 - 1977

Prepared environmental documentation, performed resource inventories, engineering design and geological studies. Developed Region-wide environmental compliance program.

EDUCATION

Regis College	MBA studies	1982	
University of Colorado	B.S. Geology	1976 - 1979	Deans List
University of Colorado	B.S Biology	1969 - 1974	Deans List
Metropolitan State College		1978, 1983	Deans List
Chapman College		1973	Deans List
Various postgraduate / ongoing classes for environmental Compliance, Water Law, etc.			

PERSONAL INFORMATION

Excellent health. Spare time includes Coach and Board Member for Soccer Club.