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STAFF REPORT

Final Staff Assessment

LA PALOMA GENERATING PROJECT

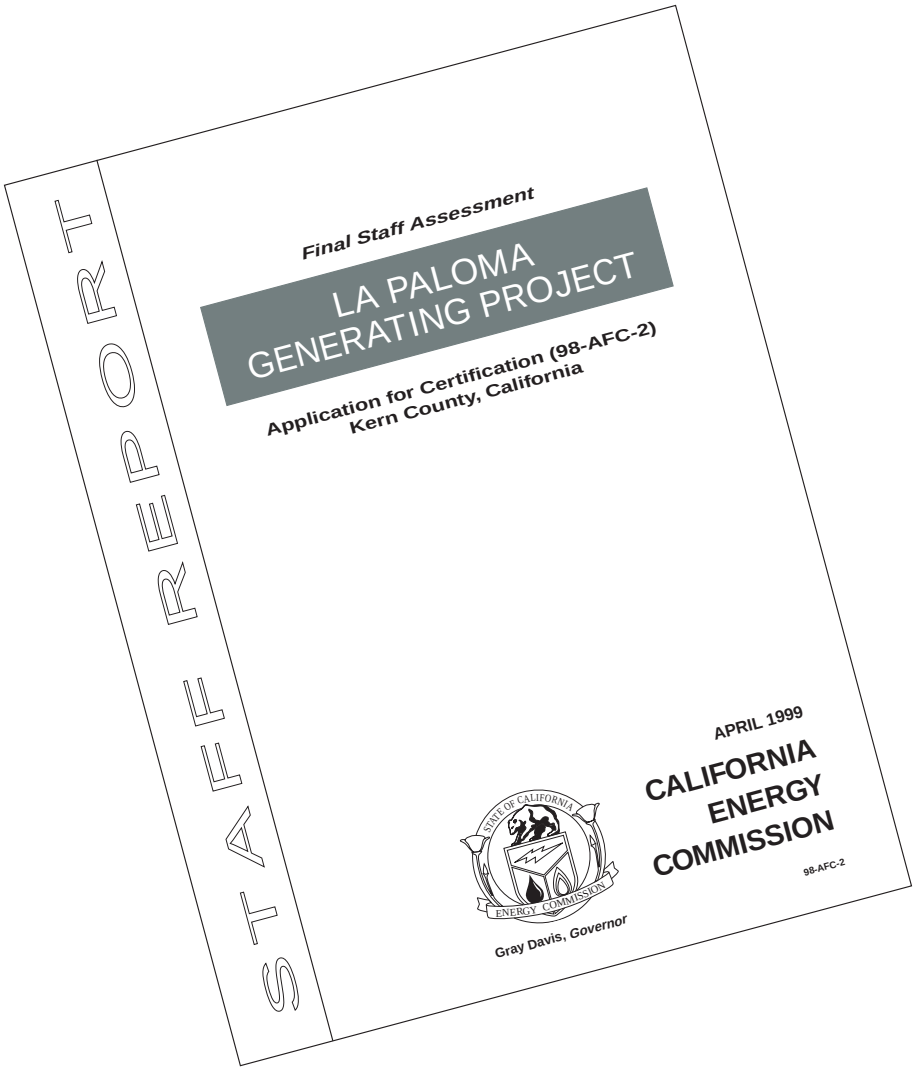
Application for Certification (98-AFC-2)
Kern County, California

APRIL 1999

CALIFORNIA ENERGY COMMISSION

Gray Davis, *Governor*

98-AFC-2



CALIFORNIA ENERGY COMMISSION

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**ENERGY FACILITIES SITING &
ENVIRONMENTAL PROTECTION DIVISION**

EXECUTIVE SUMMARY

INTRODUCTION

This Final Staff Assessment (FSA) contains the California Energy Commission (Energy Commission) staff's evaluation of the La Paloma Generating Company, LLC's (La Paloma) Application for Certification (AFC) (98-AFC-2) for the La Paloma Generating Project (LPGP). The LPGP electric generating plant and related facilities, such as the electric transmission line, natural gas pipeline and water lines are under the Energy Commission's jurisdiction and cannot be constructed or operated without the Energy Commission's certification. Staff is an independent party in the proceedings. This FSA is a staff document and it examines engineering and environmental aspects of the LPGP, based on the information available at that time of document creation. The FSA contains analyses similar to those contained in Environmental Impact Reports required by the California Environmental Quality Act (CEQA). It is not a Committee document nor is the FSA a final or proposed decision on the proposal. The FSA presents staff's conclusions and proposed conditions that staff recommends apply to the design, construction, operation, and closure of the proposed facility, if certified.

BACKGROUND

On August 12, 1998, La Paloma filed an AFC with the Energy Commission to construct and operate the LPGP. On August 26, 1998, the Energy Commission deemed the AFC data adequate, at which time staff began its analysis of the proposal. The analyses contained in this FSA are based upon information from: 1) the AFC; 2) subsequent amendments; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications; and 6) independent field studies and research.

PROJECT DESCRIPTION

The LPGP will be located near McKittrick, Kern County, California, approximately 40 miles west of Bakersfield, California. The project site is about 23 acres in size and is situated near the intersection of Reserve Road and Skyline Road. The site is the location of a former oil production field. The project will be owned and operated by the La Paloma, a subsidiary of U.S. Generating Company, LLC (USGen), which, in turn, is an unregulated subsidiary of Pacific Gas and Electric Corporation (PG&E)[1]. Electrical energy produced from the proposed merchant power plant will be sold in California's newly created electricity market pursuant to sales agreements with municipalities or other customers. Construction of the facility is expected to begin late in 1999 and commercial operation is expected to begin late 2001. The project

[1] U.S. Generating Company, LLC is not the same as PG&E, the utility. The California Public Utilities Commission does not regulate U.S. Generating Company, LLC.

costs are estimated to be $500 million. The project is expected to create an average of 451 construction jobs and 35 permanent operational jobs.

The project as proposed by La Paloma is a 1,048 megawatt, natural gas-fired, combined cycle facility. Electricity generated by the LPGP would be transmitted over a 14.2-mile long, 230kV double-circuit transmission line to PG&E's Midway Substation at Buttonwillow[2]. Cooling (i.e., raw) water would be conveyed from the California Aqueduct by an 8-mile long pipeline. Waste water would be disposed into on-site deep injection wells. Fuel for the natural gas-fired turbines would piped 370-feet from a large interstate pipeline jointly owned by the Kern River Gas Transmission Company and the Mojave Pipeline Company. A complete description of the Proposal is contained the **PROJECT DESCRIPTION** section of this FSA.

STAFF'S ASSESSMENT

Each technical area section of the FSA contains a discussion of impacts, mitigations measures and conditions of certification. The FSA includes staff's assessments of:

- the project's conformity with integrated assessment of need;
- the environmental setting of the proposal;
- impacts on public health and safety, and measures proposed to mitigate these impacts;
- environmental impacts, and measures proposed to mitigate these impacts;
- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;
- project alternatives;
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation; and
- proposed conditions of certification, where these can be identified at this time.

COMPLETE ANALYSES

Staff believes its analysis of the power plant is substantially complete for the following 17 technical areas:

*Need Conformance	Socioeconomics

[2] On March 16, 1999, La Paloma docketed with the California Energy Commission its Supplement 2 to the AFC. One of the two project changes presented in the supplement was a 0.6-mile deviation of the transmission line route (Route 1) to avoid a parcel of land owned by California Department of Fish and Game. This deviation has been designated by La Paloma as Route 1B.

Public Health	*Waste Management
Hazardous Materials Handling	Facility Design and Geology
Worker Safety & Fire Protection	*Reliability
Transmission Line Safety & Nuisance	Efficiency
Land Use	Transmissin System Engineering
Traffic and Transportation	Alternatives
Noise	*Closure and Compliance
Visual Resources	

* Does not feature revisions from the PSA.

Staff notes that La Paloma, agencies, other parties, and the public have not had an opportunity to review and comment on sections that have been revised since the Preliminary Staff Assessment (PSA). Therefore, there is a potential that La Paloma, other parties, agencies, and the public may have comments or suggestions regarding the findings, conclusions and recommendations they have not had the opportunity to consider. To the extent that staff believes it appropriate to address those comments, this FSA should not be considered complete in those areas.

INCOMPLETE ANALYSES

Five technical areas are incomplete. The areas and the reasons for being incomplete are air quality, water resources, biological resources, cultural resources, and paleontologic resources.

AIR QUALITY

The San Joaquin Valley Unified Air Pollution Control District (District) has yet to issue a preliminary Determination of Compliance (DOC), and there are important air quality technical and policy issues remaining, including:

1. La Paloma's need to secure the balance of their SO_2 and PM_{10} offset credits. La Paloma intends to use excess NO_x credits they have secured for their PM_{10} liability at an offset ratio of 1.1 to 1. The District has not made a finding yet as to whether this ratio is acceptable, but they will make a finding when they issue the preliminary DOC. The U.S. Environmental Protection Agency (EPA) may comment on this subject, in their comments on the preliminary DOC;

2. The District is expected to determine that Best Available Control Technology (BACT) for NOx is 2.5 parts-per-million (ppm) averaged over 3-hrs. However, the EPA, in the High Desert Power Plant (97-AFC-1) and Sutter Power Plant (97-AFC-2) siting cases considered that the averaging time should use a 1-hour duration.

3. La Paloma proposed a BACT level for CO of 10 ppm. EPA considers 4 ppm as the appropriate level of BACT.

4. In addition, staff is continuing to work on their cumulative impacts modeling analysis of the LPGP, Sunrise Cogeneration and Power, and Elk Hills Power Projects.

Resolution of these issues must proceed after the District's issuance of the preliminary DOC.

WATER RESOURCES

Staff has not completed an analysis of the project's conformity with the State Water Regional Control Board (SWRCB) Policy 75-58. This policy gives priority over the use of fresh water for power plant cooling to other lower quality water sources. The Class I injection well permit from the Environmental Protection Agency is anticipated in August, 1999[3]. In addition, agreements between the California Department of Water Resources, West Kern Water District and the Kern County Water Agency have not been completed regarding the proposed turnout on the California Aqueduct. Furthermore, an agreement between these agencies regarding West Kern Water District's ability to place groundwater into the aqueduct to meet any shortfalls in State Water Project deliveries has also not been completed.

BIOLOGICAL RESOURCES

The biological resources analysis contained in this FSA is as complete as possible, pending federal and state agency Biological Opinions (BO). The U.S. Fish and Wildlife Service's (USFWS) BO, initiated by the Bureau of Land Management as a Section 7 consultation, is expected to be issued after the Final Staff Assessment (FSA). However, staff understands that unforeseen issues may arise that could delay the USFWS BO.

California Department of Fish and Game (CDFG) will issue a separate BO and an Incidental Take permit. In addition, CDFG will provide their opinion after receiving the federal opinion. It is unknown, at this time, when the CDFG and USFWS documents will be provided.

CULTURAL AND PALEONTOLOGIC RESOURCES

Due to the transmission line route deviation mentioned above, additional cultural and paleontologic surveys where necessary. The results of these surveys are expected to be docketed with the Energy Commission on or about March 31, 1999.

STAFF RECOMMENDATION

Staff has identified five technical areas that are incomplete in their analyses: air quality, water resources, biological resources, cultural and paleontologic resources. Although our analysis is potentially complete in 17 areas, resolution of the remaining issues in the other five areas will be crucial to the Energy Commission's Decision on this project.

[3] La Paloma's need to file a Class I permit with US EPA, instead of a Class V with the Regional Water Quality Control Board, was determined after the filing of the PSA on February 5, 1999.

The District's Preliminary DOC was expected to be issued on March 26, 1999, but did not occur. Staff will require at least three weeks to prepare testimony that analyzes the Preliminary DOC. Until the biological and water resources issues are settled, staff cannot be certain what changes may be required to its testimony. Similarly, staff cannot determine whether the transmission line routing change will require amended testimony for cultural and paleontologic resources until La Paloma files the survey results. This analysis will take time to conduct as well, and the time required is dependent upon the results of the survey.

At this time, staff is unable to recommend that the project be certified.

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INTRODUCTION

Marc S. Pryor

PURPOSE OF THIS REPORT

The Final Staff Assessment (FSA) presents the California Energy Commission (Energy Commission) staff's independent analysis of La Paloma Generating Company, LLC's (La Paloma) Application for Certification (AFC). This assessment is prepared pursuant to Title 20, California Code of Regulations, sections 1742, 1742.5, 1743 and 1744. The FSA is a staff document. It is neither a Committee document, nor a draft decision or proposed decision. The FSA describes the following:

a) the existing environment;
b) the proposed project;
c) whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards (LORS);
d) the environmental consequences of the project including potential public health and safety impacts;
e) mitigation measures proposed by the applicant, staff, interested agencies and intervenors which may lessen or eliminate potential impacts;
f) the proposed conditions under which the project should be constructed and operated, if it is certified; and
g) project alternatives.

The analyses contained in this FSA are based upon information from: 1) the AFC; 2) subsequent amendments; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications; 6) independent field studies and research; and 7) comments received regarding the analyses presented in staff's Preliminary Staff Assessment (PSA). The analyses for most technical areas include proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of "verification". Verification is not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements. The FSA presents conclusions and proposed conditions that apply to the design, construction, operation and closure of the proposed facility.

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code, section 25500 et seq. and Title 20, California Code of Regulation, section 1701 et seq., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 15000 et seq.).

ORGANIZATION OF THE STAFF ASSESSMENT

This **INTRODUCTION** section of this FSA explains the purpose of the FSA and its relationship to the Energy Commission's siting process. The **PROJECT**

DESCRIPTION section provides a brief overview of the project including its purpose, location and major project components.

The need conformance, environmental and engineering evaluations of the proposed project follow the **PROJECT DESCRIPTION**. In the **NEED CONFORMANCE** section, staff assesses the project's conformity with the most recently adopted electricity demand forecast (***1996 Electricity Report***). In the environmental analysis, the project's environmental setting is described, environmental impacts are identified and their significance assessed, and the project's compliance with applicable laws is reviewed. The mitigation measures proposed by the applicant are reviewed for adequacy and conformance with applicable laws; remaining unmitigated impacts are identified, and staff proposes additional mitigation measures and project alternatives when necessary. Staff's conclusions and recommendations are discussed, and proposed conditions of certification are included, if applicable. In the engineering analyses, the project is evaluated in each technical area with respect to applicable laws and performance objectives. Staff proposed modifications to the facility, if applicable, are listed. Each technical section ends with a discussion of conclusions and recommendations. Proposed conditions of certification are included, if applicable.

ENERGY COMMISSION SITING PROCESS

The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, section 25500). The Energy Commission must review power plant AFCs to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts (Pub. Resources Code, section 25519), conformance with the most recent integrated assessment of need for new resource (Pub. Resources Code, section 25523(f)), and compliance with applicable governmental laws or standards (Pub. Resources Code, section 25523 (d)).

The Energy Commission's siting regulations require staff to independently review the AFC and assess whether the list of environmental impacts contained is complete, and whether additional or more effective mitigation measures are necessary, feasible and available (Cal. Code Regs., tit. 20, sections 1742 and 1742.5(a)). Staff's independent review shall be presented in a report (Cal. Code Regs., tit. 20 , section 1742.5).

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, section 1743(b)). Staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, section 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of CEQA. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Resources Agency (Public Resource Code, section 21080.5 and Cal. Code Regs. tit. 14, section 15251 (k)). The Energy Commission remains subject to all other portions of CEQA.

The staff normally prepares both a preliminary and final staff assessment. The Preliminary Staff Assessment (PSA) presents for the applicant, intervenors, agencies, other interested parties and members of the public, the staff's preliminary analysis, conclusions, and recommendations. Where staff believes it is appropriate, the Final Staff Assessment (FSA) incorporates written comments received from parties to the siting case, comments made at the workshops, and comments received on the PSA. The FSA serves as staff's testimony on a proposal.

Staff uses the PSA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the PSA and FSA, staff conducts workshops to discuss their findings, proposed mitigation, and proposed compliance monitoring requirements. Based on the workshops and written comments, staff will refine their analysis, correct errors, and finalize conditions of certification to reflect areas where we have reached agreement with the parties.

The staff's assessment is only one piece of evidence that will be considered by the Committee (two commissioners who have been assigned to a specific project) in reaching a decision on whether or not to recommend that the full Energy Commission approve the proposed project. At the public hearings, all parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties, thereby creating a hearing record on which a decision on the project can be based. The hearing before the Committee also allows all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is distributed for a minimum of 30 days in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD is required to undergo a 15-day comment period. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any party may appeal the decision to the Energy Commission.

A **Compliance Monitoring Plan and General Conditions** will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions will be presented in the PMPD. The Energy Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the

conditions adopted by the Energy Commission. The proposed **Compliance Monitoring Plan and General Conditions** are included at the end of the PSA.

PROJECT DESCRIPTION

Testimony of Marc S. Pryor

NATURE AND PURPOSE OF THE PROJECT

The La Paloma Generating Company, LLC (La Paloma) proposes to construct and operate the La Paloma Generating Project (LPGP), a 1,048 megawatt (MW) natural gas-fired, combined cycle power generating facility. The applicant's stated objective is to "… construct and operate an electrical generating facility that supplies economic, reliable, and environmentally sound electrical energy and capacity to the restructured California energy market" (LPGP 1998a, p. 2-1). Electrical energy produced from the proposed merchant power plant will be sold into the California Power Exchange (PX), in addition to bilateral sales agreements with municipalities and other power customers.

PROJECT LOCATION

The LPGP is to be located in western Kern County approximately 40 miles west of Bakersfield, and approximately two miles east of the town of McKittrick near the intersection of Reserve and Skyline Roads (PROJECT DESCRIPTION Figure 1). The project site is about 23 acres and is presently a vacant field in an oil well production area.

PROJECT DESCRIPTION

The 1,048 MW combined cycle facility is proposed to use four power islands. Each power island would be composed of one Asea Brown Boveri (ABB) natural gas turbine generator, one heat recovery steam generator (HRSG) and exhaust stack, and one steam turbine. At average site conditions, each of the combined cycle power blocks are expected to be rated at a net output of approximately 268 MW.

Air pollutants in the gas turbine exhaust will be controlled using selective catalytic reduction (SCR) technology. La Paloma proposes to use Goalline Technology's SCONOx™ emissions control technology on one of the power islands instead of SCR. La Paloma's ability to use SCONOx™ will depend upon its commercial availability from ABB Power Generation, Inc.

A proposed new 14.2-mile long, bundled 230 kilovolt (kV) double circuit electric transmission line is proposed to interconnect to Pacific Gas and Electric Company's (PG&E) Midway Substation that is located northeast of the site near the unincorporated community of Buttonwillow. The transmission line is planned to parallel the existing Midway-Sunset 230 kV and PG&E Diablo-Midway #2 500 kV transmission line. (On March 16, 1999, La Paloma filed AFC Supplement 2 that changed the route of this transmission line to avoid a parcel of land owned by California Department of Fish and Game. This accounts for the 0.6 mile increase in the length of the line that was considered in the Preliminary Staff Assessment.)

PROJECT DESCRIPTION Figure 1

A proposed new natural gas supply pipeline will be built to tap into an interstate natural gas pipeline that is jointly owned and operated by Kern River Natural Gas Transmission Company and Mojave Pipeline Company. This pipeline is located approximately 370 feet to the west of the plant site.

La Paloma proposes using California Aqueduct water which would be supplied from the West Kern Water District (WKWD) via a proposed new eight mile long pipeline. A turnout from the aqueduct, a pump station, and a 700,000 gallon reservior storage tank would be constructed as part of the project. The proposed water pipeline would follow one of two possible routes: either along the right-of-way of the proposed transmission line, or along the corridor of state Highway 58. The latter is La Paloma's preferred route (LPGP 1998a, p. 3.11-14).

Average monthly water requirements would range from about 610 acre-feet (a.f.) in the month of February, to about 680 a.f. in August. Total annual water use will be about 5,500 acre-feet. Water supplies will be guaranteed by WKWD.

Wastewater would primarily consist of blowdown water from the cooling tower system. The cooling water waste discharge is proposed to be injected into a suitable well system, or to be treated in a zero discharge system. Sanitary waste will be disposed of into an on-site leech field. Storm water runoff will be collected by storm drains and routed to a retention basin. Potable water will be provided by a proposed new pipeline from McKittrick.

CONSTRUCTION AND OPERATION

La Paloma plans to begin construction in the fall of 1999 and commercial operation by late 2001. There will be a peak work force of approximately 727 construction jobs and about 35 permanent facility operations personnel.

NEED CONFORMANCE

Testimony of Terry Ewing

INTRODUCTION

Under state law, the Energy Commission cannot certify a proposed electric generating facility unless it finds that the project conforms with the Integrated Assessment of Need contained in the Energy Commission's most recent ***Electricity Report***. This analysis examines whether the La Paloma Generating Project conforms to the Energy Commission's Integrated Assessment of Need.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

STATE

PUBLIC RESOURCES CODE

Written decisions on Applications for Certification by the Energy Commission must contain findings, including "Findings regarding the conformity of the proposed facility with the integrated assessment of need for new resource additions determined pursuant to subdivisions (a) to (f), inclusive, of Section 25305 and adopted pursuant to Section 25308 or, where applicable, findings pursuant to Section 25523.5 regarding the conformity of a competitive solicitation for new resource additions determined pursuant to subdivisions (a) to (f), inclusive, of Section 25305 and adopted pursuant to Section 25308 that was in effect at the time that the solicitation was developed." (Public Resources Code Section 25523 (f).)

CALIFORNIA CODE OF REGULATIONS

California Code of Regulations states "The presiding member's proposed decision shall contain the presiding member's recommendation on whether the application shall be approved, and proposed findings and conclusions on each of the following: (a) Whether and the circumstances under which the proposed facilities are in conformance with the 12-year forecast for statewide and service area electric power demands adopted pursuant to Section 25309(b) of the Public Resources Code." (Cal. Code of Regs., tit. 20, § 1752 (a)).

NEED CONFORMANCE CRITERIA

In order to obtain a license from the Energy Commission, a proposed power plant must be found to be in conformance with the Integrated Assessment of Need. The criteria governing this determination are contained in the 1996 Electricity Report (***ER 96***), and are most succinctly described on page 72 of that document:

> "In sum, the ***ER 96*** need criterion is this: during the period when ***ER 96*** is applicable, proposed power plants shall be found in conformance with the Integrated Assessment of Need (IAN) as long as the total number of megawatts permitted does not exceed 6,737."

CONCLUSIONS AND RECOMMENDATIONS

The Commission on November 5, 1997 adopted ***ER 96***. La Paloma Generating Project was found data adequate on August 26, 1998. Therefore, ***ER 96*** is the ***Electricity Report*** adopted most recently prior to the project being found data adequate. Staff evaluated the project based on ***ER 96*** Need Conformance Criteria.

Staff finds that the La Paloma Generating Project meets the need conformance criteria contained in ***ER 96.*** The certification of the La Paloma Generating Plant would not cause the number of megawatts permitted in this case, and any others previously approved by the Commission under ***ER 96,*** to exceed 6,737. Therefore, La Paloma is in conformance with the Integrated Assessment of Need.

AIR QUALITY

Testimony of Keith Golden

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the proposed La Paloma Generating Project (LPGP). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), volatile organic compounds (VOC) and particulate matter less than 10 microns in diameter (PM10).

In carrying out this analysis, the California Energy Commission staff evaluated the following major points:

- whether the La Paloma Generating Project is likely to conform with applicable Federal, State and San Joaquin Valley Unified Air Pollution Control District air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b),

- whether the LPGP is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b), and

- whether the mitigation proposed for the LPGP is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR analysis has been delegated by the Environmental Protection Agency (EPA) to the San Joaquin Valley Unified Air Pollution Control District (District). The EPA determines the conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceed 100 tons per year for any pollutant.

STATE

The California State Health and Safety Code, section 41700, requires that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerate number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."

LOCAL

The proposed project is subject to the following San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) rules and regulations:

RULE 2201 - NEW AND MODIFIED STATIONARY SOURCE REVIEW RULE

The main functions of the Disctrict's New Source Review Rule are to allow for the issuance of Authorities to Construct, Permits to Operate, the application of Best Available Control Technology (BACT) to new permit sources and to require the new permit source to secure emission offsets.

SECTION 4.1 - BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology is defined as: a) has been contained in any State Implementation Plan and approved by EPA; b) the most stringent emission limitation or control technique that has been achieved in practice for a class of source, or c) any other emission limitation or control technique which the District's Air Pollution Control Officer (APCO) finds is technologically feasible and is cost effective. BACT will apply to any air pollutant that results in an emissions increase of 2 pounds per day. In the case of the LPGP, BACT will apply for NOx, SO2, PM10, VOC and CO emissions from all point sources of the project.

SECTION 4.2 - OFFSETS

Emissions offsets for new sources are required when those sources exceed the following emissions levels:

- Sulfur oxides - 150 lbs/day
- PM10 - 80 lbs/day
- Oxides of nitrogen - 10 tons/year
- Volatile organic compounds - 10 tons/year

The LPGP exceeds all of the above emission levels; therefore offsets are required for all four of these pollutants. The emission offsets provided shall be adjusted according to the distance of the offsets from the LPGP. The ratios are:

- Within 15 miles of the same source - 1.2 to 1
- 15 miles or more from the source - 1.5 to 1

Section 4.2.5.3 allows for the use of interpollutant offsets (including PM10 precursors for PM10) on a case-by-case basis, provided that the applicant demonstrates that the emissions increase will not cause a violation of any ambient air quality standard. The ratio for interpollutant trading shall be based on an air quality analysis and shall be equal to or greater than the minimum offsetting requirements (the distance ratios) of this rule.

SECTION 4.3 - ADDITIONAL SOURCE REQUIREMENTS

Rule 4.3.2.1 requires that a new source not cause, or make worse, the violation of an ambient air quality standard as demonstrated through analysis with air dispersion models.

RULE 4001 - NEW SOURCE PERFORMANCE STANDARDS

Specifies that a project must meet the requirements of the Federal New Source Performance Standards (NSPS) specified in Title 40, Code of Federal Regulations, Part 60, Chapter 1. Subpart GG, which pertains to Stationary Gas Turbines, requires that NOx concentrations be less than 75 ppm, and SO2 concentrations be less than 150 ppm. This rule also limits the sulfur content of the fuel to no greater than 0.8 percent by weight.

RULE 4101 - VISIBLE EMISSIONS

Prohibits air emissions, other than water vapor, of more than Ringelmann No. 1 (20 percent opacity) for more than 3 minutes in any one hour.

RULE 4201 - PARTICULATE MATTER CONCENTRATION

Limits particulate emissions from sources such as the gas turbines, cooling towers and emergency fire water pumps to less than 0.1 grain per cubic foot of exhaust gas at dry conditions.

RULE 4305 - BOILERS, STEAM GENERATORS AND PROCESS HEATERS

Limits NOx concentrations to no greater than 30 ppm and CO concentrations to no greater than 40 ppm for boilers. These limits would apply to the temporary boiler that will be used for the heat recovery steam generator boilout chemical cleaning during the initial commissioning phase of the project.

RULE 4703 - STATIONARY GAS TURBINES

Limits NOx concentrations to less than 9 ppm and CO concentrations to less than 200 ppm for the combustion gas turbines.

RULE 4801 - SO2 CONCENTRATION

Limits the SO2 concentration emitted into the atmosphere to no greater than 0.2 percent by volume.

RULE 8010 - FUGITIVE DUST ADMINISTRATIVE REQUIREMENTS FOR CONTROL OF FINE PARTICULATE MATTER (PM-10)

Specifies the types of chemical stabilizing agents and dust suppressant materials that can (and cannot) be used to minimize fugitive dust.

RULE 8020 - FUGITIVE DUST REQUIREMENTS FOR CONTROL OF FINE PARTICULATE MATTER (PM-10) FROM CONSTRUCTION, DEMOLITION, EXCAVATION, AND EXTRACTION ACTIVITIES

Requires that fugitive dust emissions during construction activities be limited to no greater than 40 percent opacity by means of water application or chemical dust suppressants. The rule also encourages the use of paved access aprons, gravel strips, wheel washers or other measures to limit mud or dirt carry-out onto paved public roads.

RULE 8030 - CONTROL OF PM10 FROM HANDLING AND STORAGE OF BULK MATERIALS

Limits the fugitive dust emissions from the handling and storage of materials, such as the borrow fill dirt material to be used for the LPGP. It specifies that bulk materials be transported using wetting agents, allow appropriate freeboard space in the vehicles, or be covered. It also requires that stored materials be covered or stabilized.

RULE 8060 - CONTROL OF PM10 FROM PAVED AND UNPAVED ROADS

Specifies the width of paved shoulders on paved roads or the use of chemical dust suppressants on unpaved roadways, shoulders and medians.

RULE 8070 - CONTROL OF PM10 FROM VEHICLE/EQUIPMENT PARKING, SHIPPING, RECEIVING, TRANSFER, FUELING AND SERVICE AREAS

This rule is intended to limit fugitive dust from unpaved parking areas by means of using water or chemical dust suppressants or the use of gravel. It also requires that the affected owners/operators shall remove tracked out mud and dirt onto public roadways once a day.

ENVIRONMENTAL SETTING

METEOROLOGICAL CONDITIONS

The climate of the southern San Joaquin Valley is typically dominated by hot dry summers and mild winters with relatively small amounts of precipitation. The semi-permanent Pacific High over the eastern Pacific Ocean dominates the weather during the summer months, blocking low pressure systems from passing through the area. The Pacific High, along with the Temblor Range to the west that blocks the marine air influence from the Pacific Ocean, results in summers that are usually quite warm, with average daily maximum temperatures during July of over 98^{o}F.

During the winter months, the Pacific High weakens and migrates to the south allowing Pacific storms into California. The annual rainfall in the Bakersfield area is only 5.7 inches. In between storms, high pressure from the Great Basin High can block storms and result in persistent tule fog caused by temperature inversions. Daily maximums during the December-January months are a relatively mild 57^{o}F, with lows averaging 38^{o}F. At the Maricopa weather station, a record high of 115^{o}F and record low of 15^{o}F was measured. These temperatures are used in determining the maximum possible emissions from the LPGP and the maximum emission impacts in the air dispersion modeling analysis.

Winds in the area are strongly influenced by the Temblor Range to the west and the marine air that enters the Central Valley through the Carquinez Strait and Altamont Pass in the Bay Area to the north. During the summer, marine air entering the Central Valley results in northeasterly winds in the daytime hours. In the nighttime hours downslope drainage of air from the hills and mountains to the south and west results in winds from the southwest. This windflow pattern is fairly consistent throughout the year, although there is more variability to wind directions during the winter with the passage of storms through the area. Winds are usually of higher speeds during the summer because during the winter, calm and stagnant atmospheric conditions can occur between storms and the influence of the marine air from the coast is significantly diminished.

Along with the winds, another climatic factor is atmospheric stability and mixing height. Atmospheric stability is an indicator of the air turbulence and mixing. During the daylight hours of the summer when the earth is heated and air rises, there is more turbulence, more mixing and thus less stability. During these conditions there is more air pollutant dispersion and therefore usually fewer air quality impacts from a single air pollution source like the LPGP. During the winter months between storms, very stable atmospheric conditions occur, resulting in very little mixing. Under these conditions, little air pollutant dispersion occurs, and consequently higher air quality impacts result from stationary source emissions. Mixing heights are generally lower during the winter, along with lower mean wind speeds and less vertical mixing.

EXISTING AIR QUALITY

The Federal Clean Air Act and the California Air Resources Board (CARB) both required the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more protective) than the federal AAQS, which are established by the federal Environmental Protection Agency (EPA). The state and federal air quality standards are listed in AIR QUALITY Table 1. As indicated in AIR QUALITY Table 1, the averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to an annual average. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air (mg/m^3 and μg/m^3).

AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O3)	1 Hour	0.12 ppm (235 $\mu g/m^3$)	0.09 ppm (180 $\mu g/m^3$)
	8 Hour	0.08 ppm (157 $\mu g/m^3$)	---
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO2)	Annual Average	0.053 ppm (100 $\mu g/m^3$)	---
	1 Hour	---	0.25 ppm (470 $\mu g/m^3$)
Sulfur Dioxide (SO2)	Annual Average	80 $\mu g/m^3$ (0.03 ppm)	---
	24 Hour	365 $\mu g/m^3$ (0.14 ppm)	0.04 ppm (105 $\mu g/m^3$)
	3 Hour	1300 $\mu g/m^3$ (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655 $\mu g/m^3$)
Respirable Particulate Matter (PM10)	Annual Geometric Mean	---	30 $\mu g/m^3$
	24 Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
	Annual Arithmetic Mean	50 $\mu g/m^3$	---
Fine Particulate Matter (PM2.5)	24 Hour	65 $\mu g/m^3$	---
	Annual Arithmetic Mean	15 $\mu g/m^3$	---
Sulfates (SO_4)	24 Hour	---	25 $\mu g/m^3$
Lead	30 Day Average	---	1.5 $\mu g/m^3$
	Calendar Quarter	1.5 $\mu g/m^3$	---
Hydrogen Sulfide (H_2S)	1 Hour	---	0.03 ppm (42$\mu g/m^3$)
Vinyl Chloride (chloroethene)	24 Hour	---	0.010 ppm (26 $\mu g/m^3$)
Visibility Reducing Particulates	1 Observation	---	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

In July, 1997, the EPA promulgated new ozone and PM2.5 (particulate matter less than 2.5 microns in diameter) ambient air quality standards, which are shown in AIR QUALITY Table 1. The new 8-hour ozone standard will replace the existing 1-hour standard. The PM2.5 standards will be in addition to the existing PM10 standards. Although the standards may be set, the EPA will first have to designate areas which

violate these new standards, and then air districts that violate these standards will have to prepare implementation plans to reach attainment of those standards.

In general, an area is designated as attainment for a specific pollutant if the concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified. Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status.

The LPGP is located in the Kern County portion of the San Joaquin Valley Air Basin and, as stated above, is under the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District. This area is designated as non-attainment for both the state and the federal ozone and PM10 standards, attainment for the state's CO, NO2, SO2, SO4 and Lead standards, attainment for the federal SO2 standard, and unclassified/attainment for the federal CO and NO2 standards (ARB 1998).

Ambient air quality data has been collected by the oil companies, known as the Westside Operators, in western Kern County for a number of years. Ambient air quality data collected between 1993 and 1995 at the Westside Operators Fellows site, located approximately 9 miles south-southeast of the project site is presented in AIR QUALITY Table 2. That data shows there have been no violations during that period of the NO2, SO2 or CO ambient air quality standards.

Additional ambient air quality data from the Air Resources Board's ozone monitor in Maricopa (20 miles to the southeast of the project site) and Taft College PM10 monitor (14 miles to the southeast of the project site) are shown in AIR QUALITY Table 3. This data shows that frequent violations of the state 1-hour ozone and 24-hour PM10 standard have occurred between 1993 and 1997. There appears to be no clear trend of significant improvement in the ambient concentrations of these two pollutants.

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. Nitrogen oxides (NOx) and hydrocarbons (Volatile Organic Compounds [VOCs]) interact in the presence of sunlight to form ozone. The collected air quality data indicate that the ozone violations occurred primarily during the period of May through October.

AIR QUALITY Table 2
PM10, NO2, CO and SO2 Ambient
Air Quality Data Collected at Fellows

Pollutant	Averaging Time	1995	1994	1993	Most Restrictive Ambient Air Quality Standard
PM10	24 hours	80	85	109	50
	Annual	24.6	25.9	31.0	30
NO2	1 hour	62	94	92	470
	Annual	12.6	14.4	16.6	100
CO	1 hour	2440	2303	2941	23,000
	8 hour	1869	1985	2222	10,000
SO2	1 hour	65	94	36	655
	3 hours	36	57	27	1300
	24 hours	13	20	14	130
	Annual	1.5	1.8	1.8	80

AIR QUALITY Table 3
Ozone and PM10 Ambient Air Quality Data

Pollutant & Location		1997	1996	1995	1994	1993
Ozone Maricopa	Max. conc.(ppm)	.12	.12	.13	.13	.12
	# days exceed standard	24	63	57	11	17
PM10 Taft College	Max. conc ($\mu g/m^3$)	78	94	93	64	118
	# days exceed standard	6	12	15	6	13
	% of samples above 24-hour standard	10%	20%	25%	11%	23%

California Ozone Ambient Air Quality Standard: 0.09 ppm (1-hour average)
National Ozone Ambient Air Quality Standard: 0.12 ppm (1-hour average)
California PM10 Ambient Air Quality Standard: 50 $\mu g/m^3$ (24-hour average)

In the most recent ARB report on the contribution of various districts to ozone violations in other districts (ARB 1996), the San Joaquin Valley Air Basin contributes measurably to ambient ozone levels in other districts, as well as other districts contributing measurably to the San Joaquin Valley's ozone problems. The report concludes that sources within the San Joaquin Valley Air Basin contribute to ozone levels in Mountain County districts to the northeast, the South Central Air Basin to

the south, to the Mojave Desert to the east, the Sacramento area to the north, the Great Basin Valleys to the east, and to the North Central Coast Air Basin to the west. Conversely, emissions from districts such as the San Francisco Bay Area and the Sacramento area contribute to San Joaquin Valley's ozone problems. This widespread contribution from one geographic area to another demonstrates the regional nature of the ozone problem and ozone formation.

AMBIENT PM10

As Table 3 indicates, the project area also annually experiences a number of violations of the state 24-hour PM10 standard, although violations of the federal 24-hour standard are not occurring. The violations of the state 24-hour standard occur predominately between the months of August and February, with the highest number of violations occurring from September through November.

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx and VOC from turbines, and NH3 from NOx control equipment can, given the right meteorological conditions, form particulate matter known as nitrates (NO3), sulfates (SO4), and organics. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere.

A number of studies have been undertaken to understand the particulate phenomenon, both PM10 and the smaller PM2.5, in the San Joaquin Valley. La Paloma has undertaken an extensive review of the literature to specifically address the role of nitrogen oxides emissions in the formation of particulate matter (Sylte 1999). Major sources of information on the subject are available from the District and CARB. La Paloma has concluded the following about the NOx/PM10 relationship:

- NOx emissions contribute significantly to the formation of particulate nitrate in the region where the LPGP is located, and

- ammonium nitrate is the largest contributor to PM10 levels during the winter when ambient PM10 levels are at their highest.

Staff's assessment of the NOx contribution to particulate nitrate formation (CARB 1993-1997) (Chow et al. 1993) corroborates La Paloma's conclusion; that emissions of gaseous NOx emissions can contribute a substantial portion of the ambient particulate nitrate in the southern San Joaquin Valley, especially during the winter season when the PM10 levels are the highest.

PROJECT DESCRIPTION AND EMISSIONS

CONSTRUCTION

The LPGP will include not only the power plant, but the following ancillary facilities as well:

- a water supply pipeline pumping station located adjacent to the California Aqueduct,
- an eight mile long, 24-inch diameter raw water supply line from the pumping station to the project site,
- a 700,000 gallon water storage tank along the raw water supply line approximately 1.5 miles from the project site,
- a 9,000 foot long, 6-inch diameter, potable water supply line from the West Kern Water District supply line in McKittrick,
- a three-well waste water injection wellfield located on the power plant site,
- a 370 foot long, 20-inch diameter natural gas tap line to the Kern/Mojave pipeline, and
- a 14.2 mile long double circuit transmission line from the project to the Midway Substation to the north.

The construction of facilities will generate air emissions, primarily fugitive dust from earth moving activities and combustion emissions generated from the construction equipment and vehicles. The projected highest daily emissions, based on the highest monthly emissions over the 24 month construction activity are shown in AIR QUALITY Table 4. It should be noted that the emissions shown in Table 4 will likely not occur on one single day. For example, the highest NOx emissions for the project site activity occur during month 11, while the highest NOx emissions for the raw water and pumping station activity occur during month 14.

AIR QUALITY Table 4
Maximum Daily Construction Emissions
(lb/day)

	NOx	VOC	CO	PM10	Fugitive PM10
Project Site	1262.1	152.1	920.9	89.5	62.7
Borrow Fill for Project Site	28.0	4.4	26.0	31.7	0.3
Water Pipeline & Pumping Station.	491.2	94.8	34.1	24.4	negligible
Transmission Line	287.1	62.0	27.8	20.4	negligible
Potable Water Line & Injection wells	336.2	94.0	33.7	24.0	negligible
Water Storage Tank[a]	152.2	19.4	116.5	40.7	28.7
Notes: All activities based on an 8 hour workday [a] Maximum daily emissions include construction activity as well as removal of material from the tank site.					

PROJECT SITE

The power plant itself will take approximately two years to construct. The power plant project construction itself consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest air emissions are generated during the civil/structural activity, where work such as grading, site preparation, foundations, underground utility installation and building erection occur. These types of activities require the use of large earth moving equipment, which generate considerable combustion emissions themselves, along with creating fugitive dust emissions. The mechanical construction includes the installation of the heavy equipment, such as the combustion and steam turbines, the heat recovery steam generators, condenser, pumps, piping and valves. Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more emissions than other construction equipment onsite. Finally, the electrical equipment installation occurs, involving such items as transformers, switching gear, instrumentation and wiring, and is a relatively small emissions generating activity in comparison to the early construction activities.

Not surprisingly, the largest level of construction emissions for the project will occur from the project site activity, most of it due to earth moving and grading activities and large crane operations.

BORROW SOIL SITE

For grading at the project site, approximately 7,000 cubic yards of soil will be needed. This soil will come from an offsite location, which at this point has not been identified. The applicant has identified one possible source known as Coopers Pit, located approximately 10 miles west of the project site along Highway 58 (LPGP 1998b). In order to deliver the necessary fill material, approximately 48 round trip

truck deliveries will take place over the course of nine days. The combustion emissions and fugitive PM10 emissions associated with the transport of the borrow soil are summarized in AIR QUALITY Table 4, which assumes that the borrow soil site would be approximately 10 miles away from the project site.

WATER PIPELINE AND AQUEDUCT PUMPING STATION

The construction of the raw water pipeline and pumping station includes the activities of clearing and grading, trenching, stringing the pipes and fittings, lining and connecting, and backfill and clean-up. The emissions generating equipment include one or two bulldozers, one motorgrader, one or two backhoes, a trenching machine and a sideboom tractor. The one-half acre site for the aqueduct pumping station will require some excavation and backfill, along with the installation of the pumps themselves. The planned construction schedule for this activity is between the 9th and 14th month of the 24-month schedule.

The maximum daily emissions from the construction of the raw water and aqueduct pumping station is shown in AIR QUALITY Table 4.

The construction of the raw water pipeline and pumping station will require much less in emissions generating equipment than that necessary for the power plant itself.

WATER STORAGE TANK

The construction of the water storage tank along the raw water pipeline will take about three months and be concurrent with the raw water pipeline construction schedule. The land area disturbed will be approximately one-half an acre and will require the excavation of approximately 5,000 cubic yards of earth material at the site. Some of this material may be used as fill for the project site and/or the pump station turnout site. The emissions associated with the construction of the water storage tank are shown in AIR QUALITY Table 4 (LPGP 1998c).

POTABLE WATER AND WELL INJECTION FIELD

The construction of the short potable water supply pipeline will use similar equipment as the larger raw water pipeline, although there should be less equipment involved because of its small diameter and shorter distance. The schedule for the installation of this water line is between the 4th and 5th month.

The construction of the well injection field will require about the same numbers and types of equipment as the raw water pipeline and will be in the same area as the power plant project itself. The planned construction of this well field will be between the 11th and 15th month of the construction schedule.

The maximum emissions from the activities associated with the construction of the potable water line and the well injection field are shown in AIR QUALITY Table 4. The highest emissions are from the well injection field construction activity.

TRANSMISSION LINE

The construction of the transmission line is planned to take approximately 8 months between the 12th and 20th month of the project construction schedule. The significant emissions generating vehicles are the trucks used to deliver the transmission tower structural materials, boom trucks and mobile cranes. Maximum emissions from the transmission line construction are shown in AIR QUALITY Table 4.

TEMPORARY HRSG CHEMICAL CLEANING BOILER

During the initial commissioning phase of the project operation, each heat recovery steam generator (HRSG) will undergo a chemical cleaning, called a "boilout", using a temporary mobile boiler. This natural gas boiler, of approximately 250 horsepower, will be used for approximately 3 days for each HRSG. Emissions for this boiler are shown in AIR QUALITY Table 5.

AIR QUALITY Table 5
Temporary HRSG "Boilout" Chemical Cleaning Boiler Emissions

Time Periods	NOx	SO2	PM10	VOC	CO
Hourly - lbs/hour	0.44	0.021	0.11	0.05	0.69
Daily – lbs/day	10.6	0.504	2.6	1.2	16.4
Monthly (Total of 12 days of operation) - lbs/12 days	127.2	6.05	31.2	14.4	196.8

OPERATIONAL PHASE

EQUIPMENT DESCRIPTION

- The major components of the LPGP consist of the following:Four combustion turbine generators (CTG), using the Asea Brown Boveri (ABB) Model GT 24, nominally rated at 171.1 MW. Each of the CTGs would be equipped with evaporative inlet air coolers;
- Four unfired heat recovery steam generators (HRSG) and ancillary equipment;
- Four steam turbines, each rated at 96 MW;
- Two ten-cell cooling towers;
- One diesel fuel fired fire water pump; and
- Four diesel fuel fired emergency power pumps.

EQUIPMENT OPERATION

The CTGs will burn only natural gas, and there are no provisions for an alternative back-up fuel.

La Paloma is requesting that the project be analyzed with the assumption of 50 start-ups per turbine each year. There are, however, various durations of start-up of the CTGs, depending on length of time that the turbine has been shutdown and the temperatures and pressures on the steam turbine side of the power generation block. The usual practice is to define start-ups as either a hot start, a warm start or a cold start, with the start-up period being defined as the length of time until the gas turbine is fully loaded, that is, producing baseload electrical power. A hot start would occur after an overnight turbine shutdown. The duration of a hot start is relatively short, approximately half an hour. A warm start-up is also approximately 30 minutes in duration, although the steam turbine ramping up period would be longer than a hot start. A warm start-up duration would occur after a typical weekend shutdown (approximately 60 to 72 hours). A cold start takes considerably longer, on the order of two hours. However, this type of start-up would be very rare, occurring only after the turbines have been under extended shutdown, such as the annual maintenance inspection that the manufacturer may require. Because of the thermal efficiency of the project, it is highly likely that the LPGP will operate extensively, therefore extended shutdowns are not likely to occur.

La Paloma has requested that the project be analyzed assuming that of the 50 start-ups per turbine each year, that 10 start-ups be defined as cold start and that 40 would be defined as warm or hot start-ups. Staff believes that the more likely scenario is that, barring major mechanical malfunction of the equipment itself, cold start-ups may occur once or twice a year, most likely during the annual maintenance and inspection. Staff would expect that the vast majority of start-ups will be hot or warm starts, thus minimizing start-up periods of time.

The diesel-fired emergency fire water pump will only operate if the electric motor pump fails to start or the pressure in the fire water distribution header drops below a certain set point. To be sure that this fire water pump is ready to operate, La Paloma intends to operate the diesel engine once a week for one hour.

In addition to the emergency fire water pump, there will be four diesel-fueled emergency generators. These Caterpillar generators, either 300 kW or 320 kW, will be used in the event of a power grid outage and the CTGs would coincidently be down. In order to maintain lube oil circulation in the CTGs, the turbine shafts will be rotated with these four generators. It is very unlikely that these four generators would actually have to operate as intended. However, to be sure they are available as needed, La Paloma has proposed that each of the four would be test-fired once a month, presumably for approximately one hour for each engine test.

EMISSION CONTROLS

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO2 and PM10 emissions. Natural gas contains very small amounts of a sulfur compound known as mercaptan, which when combusted, results in sulfur dioxide emissions in the flue gas. However, in comparison to other fuels used in power plants, such as fuel oil or coal, the sulfur dioxide emissions from the combustion of natural gas are very low.

Like SO2, the emissions of PM10 from natural gas combustion are very low compared to the combustion of fuel oil or coal. Natural gas contains very little noncombustible gas or solid residue, therefore it is a relatively clean-burning fuel. A sulfur content of 0.75 grains of sulfur per 100 standard cubic feet of natural gas was assumed for the SO2 emission calculations.

To minimize NOx, CO and VOC emissions during the combustion process, the ABB GT-24 turbine is equipped with the latest dry low-NOx combustor design developed by ABB, called the Sequential Combustion System. A more detailed discussion of this combustion technology is presented in the Mitigation section of this analysis.

After combustion, the flue gases pass through the heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NOx, CO and VOC emissions. La Paloma is proposing to use a Selective Catalytic Reduction (SCR) system to reduce NOx emissions. Another catalyst, an oxidizing catalyst, will also be installed in the HRSG to reduce CO and VOC emissions. La Paloma is also exploring the possibility of installing a new catalyst technology, SCONOx^{TM}, in lieu of the SCR and oxidizing catalyst in one of the four HRSGs. A more complete discussion of these catalyst technologies is included in the Mitigation section.

PROJECT OPERATING EMISSIONS

The proposed project's criteria air pollutant emissions during short periods of time, one hour or less, are shown in AIR QUALITY Table 6. This table presents the combustion turbine, cooling tower and diesel fire pump back-up generator. As this table shows, the highest emissions are from the combustion turbine, with the emissions during startup and shutdown being significantly higher than during steady state, full load operation. Most notable, emissions of NOx, VOC and CO are significantly higher during startup and shutdown. These higher emissions occur because the turbine combustor technology is designed for maximum efficiency during full load steady state operation.

AIR QUALITY Table 6
Project (Per CTG) Hourly Emissions
(pounds per hour [lb/hr] except where noted)

Operational Profile	NOx	SO2	PM10	VOC	CO
CTG Cold Start-up (100 minutes)	72	0.9	24.1	72	1185
CTG Warm Start-up (30 min)	44	0.3	5.6	39	600
CTG Hot Start-up (30 min)	21	0.3	5.6	15	150
Shutdown (23 minutes)	63	0.3	4.8	9.9	223
CTG Steady State @ 100% load at 15^{o}F	17.54	3.73	17.2	2.67	21.08
CTG Steady State @ 100% load at 65^{o}F	16.26	3.48	16.0	2.59	19.88
Cooling Towers	--	--	0.94	--	--
Emergency Generator (one)	7.2	--	0.4	1.1	8.9
Emergency Fire-water Pump	5.4	0.4	0.1	0.2	1.0
4 CTGs at Steady State at 65^{o} F & Cooling Tower	65.04	13.92	64.94	10.36	79.52

During startup and shutdown, combustion temperatures and pressures are rapidly changing, which results in less efficient combustion and higher emissions. Also, the flue gas controls, the catalysts discussed above, operate most efficiently when the turbine operates near or at full load. Those flue gas controls are not as effective during the transitory temperature changes that occur during startup and shutdown. The start-up emissions data reflect information provided by ABB (ABB 1998) that are believed to be more realistic than start-up data previously submitted in the AFC. La Paloma has agreed that their project would be analyzed based on this recent ABB start-up data.

The daily emissions from the project are shown in AIR QUALITY Table 7. The table shows different operating scenarios, and the resultant emissions, including CTG startup (cold, warm and hot), shutdown, and steady state operation. The operation of the cooling tower, diesel fueled emergency fire pump and generators are also included. A highest daily emissions level scenario is presented in the last row of the table.

AIR QUALITY Table 7
Project Daily Emissions
(pounds per day [lb/day])

Operational Profile	NOx	SO2	PM10	VOC	CO
4 turbine sequential cold-start and steady state operation	1523.76	268.08	1312.4	484.84	6250.88
4 turbine sequential warm start and steady state operation	1655.66	320.28	1552.4	391.69	4209.08
4 turbine sequential hot start and steady state operation	1563.66	320.28	1552.4	295.69	2411.67
4 turbine 24-hr steady state full load operation	1560.96	334.08	1536.0	248.64	1908.48
Cooling towers operating 24-hr	--	--	22.48	--	--
4 emergency generators	28.8	--	1.6	4.2	35.6
Emergency fire-water pump operating 1 hour	5.4	0.4	0.1	0.2	1.0
Typical daily operation - 4 turbines operate full load and cooling towers	1560.96	334.08	1558.48	248.64	1908.48

Annual emissions are summarized in the AIR QUALITY Table 8. La Paloma has requested that the project be analyzed assuming 10 cold start-ups per turbine per year, and 40 warm or hot start-ups per turbine per year. The balance of the year's operation assumes full load operation of the CTGs. This type of operational scenario is actually not possible, since by definition, the start-ups must be preceeded with no turbine operation and thus no emissions. In the case of the ten cold start-ups, the turbines would have to be down for many days before a cold start would be initiated. Therefore, the assumption of 8720 hours of steady state operation could not happen.

For comparison, staff has presented the scenario of all four turbines operating non-stop throughout the year. The highest annual emissions of SO2 and PM10 would occur with this scenario, since those emissions are a function of the quantity of fuel burned. The annual emissions of NOx, VOC and CO would be higher with the inclusion of the start-up emissions. Also included in Table 8 are the total Initial Commissioning emissions, which not surprisingly, are not insignificant in comparison to the likely commercial operation annual emissions.

AIR QUALITY Table 8
Project Annual Emissions
(tons per year [ton/yr])

Operational Profile	NOx	SO2	PM10	VOC	CO
10 cold starts, 40 warm starts, remainder steady state[a]	289.42	60.76	284.12	49.85	419.36
Steady state operation entire year[b]	285.76	61.00	284.47	45.50	349.25
Initial Commission Phase - 4 1/2 mos. operation	135	NA	20	56	431

Notes:
[a] Assume 20 hr cold start, 20 hr warm start, 8720 hr steady state, 8760 hours cooling towers operation, 52 hours each for fire-water pump and four emergency generators

[b] Assume 8760 hr steady state for four turbines and cooling towers and 52 hours each for fire-water pump and four emergency generators

AMMONIA EMISSIONS

Due to the large combustion turbines used in this project and the need to control NOx emissions, significant amounts of ammonia will be injected into the flue gas stream as part of the SCR system. Not all of this ammonia mixes in the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered, out the stacks. These ammonia emissions are known as ammonia slip. La Paloma has committed to an ammonia slip no greater than 10 ppm, which is the current lowest ammonia slip level being achieved and permitted throughout California. On a daily basis, the ammonia slip of 10 ppm is equivalent to approximately 2,333 lbs/day of ammonia emitted into the atmosphere. This level of emissions is based on all four HRSGs installed with SCR, however one of the HRSGs may be installed with SCONOx^{TM}, which does not require ammonia injection.

It should be noted that the ammonia slip of 10 ppm is usually associated with the degradation of the SCR catalyst, usually in a time frame of five years or more after initial operation. At that point, the SCR catalysts are removed and replaced with new catalysts. Through most of the operation of the SCR system, ammonia slip emissions are usually in the range of 1 to 2 ppm, corresponding to a mass emissions in the LPGP case to approximately 200 to 500 pounds per day. The implications of these ammonia emissions are discussed later in this analysis.

INITIAL COMMISSIONING PHASE OPERATION AND EMISSIONS

Prior to the first firing of the combustion turbines, the temporary HRSG boilout chemical cleaning boiler will be used. The combustion turbines will then undergo the initial firing and commissioning phase of the project schedule. La Paloma is requesting that up to 4 1/2 months for each turbine be considered as the initial comissioning phase of the project's operation. During this period, emissions may exceed permitted levels, due to start-ups, shutdowns, extended periods of low load

operation and periods of time when the low-NOx burners and SCR systems will need to be fine tuned for optimum performance.

Over each 4 1/2 month period, La Paloma estimates that each CTG will operate approximately 740 hours and undergo approximately 5 cold starts, 25 hot starts and 30 shutdowns. The emissions associated with this initial commissioning phase are shown in AIR QUALITY Table 8. The highest emissions occur because of extended periods of partial load operation, where emissions of CO, in particular, would be expected to be higher. It should be noted that it is in the owner's best interest to minimize this initial commissioning phase in order for the project to be declared ready for commercial operation and thus able to generate revenues. Therefore, it is expected that this initial commissioning phase will, to the extent feasible, be as short as possible and thus minimize the higher than normal operations emissions that are inevitable during the necessary testing.

The District has a policy that after the initial firing of a piece of permitted equipment, the source test demonstrating compliance with the permit limits must be performed within 60 days. It is our understanding that La Paloma is requesting that this source testing not be performed for the one combustion turbine that may use SCONOX^{TM} until 90 days after initial equipment firing. The District will address this issue in their Preliminary Determination of Compliance.

The District stated in a recent letter (SJVUAPCD 1999) that "…no relief from the permit conditions during initial commissioning were proposed or will be included in our conditions of approval." They go on to say that La Paloma may use the District's equipment breakdown and variance procedures that can offer relief from permit conditions if violations of limits do occur. Based on the emissions information currently provided by La Paloma, it is highly likely that during the initial commissioning phase of operation of the project, that excursions of the permit limits will occur and that La Paloma will have to file for a variance during the initial commissioning phase.

FACILITY CLOSURE

Eventually the LPGP will close, either as a result of the end of its useful life, or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, then all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur.

The Permit to Operate, issued by the District under Rule 2010, is required for operation of the facility and is usually renewed on a five year schedule. However, during those five years, the applicant must still pay permit fees annually. If the applicant chooses to close the facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the applicant pays the fees to renew the Permit to Operate.

If La Paloma were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. District Rule 8020 requires

that during demolition that fugitive dust emissions be limited to no greater than 40% opacity by means of water application or chemical suppressants. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should include the specific details regarding how La Paloma plans to demonstrate compliance with the District Rule 8020.

PROJECT INCREMENTAL IMPACTS

MODELING APPROACH

Staff performed an air dispersion modeling analysis to evaluate the project's potential impacts on the existing ambient air pollutant levels, both during construction and operation. An air dispersion modeling analysis usually starts with a conservative screening level analysis. Screening models use very conservative assumptions, such as the meteorological conditions, which may or may not actually occur in the area. The impacts calculated by screening models, therefore, can be double or more than the actual or expected impacts. If the screening level impacts are significant, refined modeling analysis is performed. A major difference in the refined modeling is that hour-by-hour meteorological data collected in the vicinity of the project site is used. The Industrial Source Complex Short-Term model, Version 3, known as the ISCST3 model, was used for the refined modeling.

CONSTRUCTION IMPACTS

La Paloma performed air dispersion modeling analyses of the potential construction impacts at the project site. The analyses included fugitive dust generated from the construction activity (modeled as an area source) and combustion emissions from the equipment (modeled as four point sources). The emissions used in the analysis were the highest emissions of a particular pollutant during a one month period, converted to a gram per second emission rate for the model. Most of the highest emissions occurred about half-way through the 24-month construction period.

The results of this modeling effort are shown in AIR QUALITY Table 9. They show that the construction activities would cause a violation of the state 1-hour and annual average NO2 standards and further exacerbate existing violations of the state 24-hour and annual average PM10 standards. In reviewing the modeling output files, the project's construction impacts are not occasional or isolated events, but are over an area within a few hundred meters of the project site. These predicted impacts are of such a high magnitude for a number of reasons.

AIR QUALITY Table 9
Maximum Construction Impacts

Pollutant	Averaging Time	Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard
NO2	1-hour	9474	94	9568	470	2036
	Annual	84	16.6	100.6	100	101
CO	1-hour	9218	2941	12159	23,000	53
	8-hour	3496	2222	5718	10,000	57
SO2	3-hour	564	57	621	1300	48
	24-hour	33	20	53	130	41
	Annual	7.3	1.8	9.1	80	11
PM10	24-hour	144	118	262	50	524
	Annual	24	31.7	55.7	30	186

First, the model itself calculates impacts that are very conservative, usually exceeding actual impact levels by a considerable margin. Second, the analysis assumes that all the NOx emitted from the vehicles is in the form of NO2. In reality, approximately 90 percent of NOx emissions from a combustion source are in the form of nitrogen oxide (NO), and eventually that NO would oxidize to NO2. Therefore, the NO2 impact shown in the modeling analysis does not realistically reflect the possible NO2 impacts.

Third, some of the sources of combustion emissions (the bulldozers and trucks) are mobile sources, not stationary sources as input into the model. Therefore, as mobile sources, the air quality impacts would not always be at the same locations, so the model results are overstated. Fourth, it was assumed that all the equipment identified for the modeling evaluation would be running simultaneously. It is doubtful that all the major equipment, 4 large bulldozers, 4 backhoes, 12 cranes and 5 large flatbed trucks would all be operating at one time, and thus the impacts are overstated.

Finally, the emissions inputs to the model were from the highest monthly emissions assumed during the 2-year construction period. The levels of emissions used reflect a period of activity of approximately one year, not the entire 2 year construction. During the other months of construction work, considerably less emissions generating equipment will be used and thus the impacts will be lower.

Although construction of the LPGP will result in unavoidable short-term impacts, it is doubtful that the general public would be exposed to the construction impacts associated with the project. This is because of the project's rather isolated location away from any population centers in a heavily industrial area (the surrounding

oilfields), where the impacts would actually occur. Nevertheless, staff believes that the impact from the construction of the project could have a significant and unavoidable impact on the NO2 and PM10 ambient air quality standards, and should be avoided or mitigated, to the extent feasible.

PROJECT OPERATION IMPACTS

The air quality impacts of project operation are shown in the following sections for fumigation meteorological conditions, and during combustion turbine start-up and steady-state operations.

FUMIGATION IMPACTS

During the early morning hours before sunrise, the air is usually very stable. During such stable meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed. When the sun first rises, the air at ground level is heated, resulting in a vertical (both rising and sinking air) mixing of air for a few hundred feet or so. Emissions from a stack that enter this vertically mixed layer of air will also be vertically mixed, bringing some of those emissions down to ground level. Later in the day, as the sun continues to heat the ground, this vertical mixing layer becomes higher and higher, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts approximately 30 to 90 minutes.

The applicant used the SCREEN3 model, which is an EPA approved model, for the calculation of fumigation impacts. AIR QUALITY Table 10 shows the modeled fumigation results and impacts on the 1-hour NO2, CO and SO2 standards. Since fumigation impacts will not typically occur much beyond a 1-hour period, only impacts on these 1-hour standards were addressed. The results of the modeling analyses show that fumigation impacts at either partial load (50 percent) or full load will not violate the NO2, CO or SO2 1-hour standards.

AIR QUALITY Table 10
CTG Fumigation Modeling Maximum 1-Hour Impacts

Pollutant	% Load of Turbines	Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard
NO2	50	11.1	94	105.1	470	22
	100	13.3	94	107.3	470	23
CO	50	27.6	2941	2968.6	23,000	13
	100	16.3	2941	2957.3	23,000	13
SO2	50	2.5	94	96.5	655	15
	100	2.9	94	96.9	655	15
Notes: Modeling was performed at both 15°F and 65°F. Highest impacts occurred at 65°F, presented here.						

REFINED MODELING ANALYSIS

La Paloma provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project both during normal steady state operation and during start-up conditions. The results of this modeling analysis are shown in AIR QUALITY Table 11. This table shows that during normal operation of

AIR QUALITY Table 11
Combustion Turbine Refined Modeling Maximum Impacts

Pollutant	Project Operation, load, and ambient temperature	Averaging Time	Impact ($\mu g/m^3$)	Back-Ground ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard
NO2	4 turbines, 100%, 65°F	1-hour	99.0	94	193	470	41
	2 turbines start-up, 2 turbines 100%, 15°F	1-hour	206.3 with OLM	94	300.3	470	64
	4 turbines, 100%, 65°F	Annual	0.66	16.6	17.3	100	17
CO	4 turbines, 100%, 65°F	1-hour	121.0	2941	3062	23,000	13
	2 turbines start-up, 2 turbines 70% load, 15°F	1-hour	1015.9	2941	3956.9	23,000	17
	4 turbines start-up, then 100% load, 65°F	8-hour	98.5	2222	2320.5	10,000	23
SO2	4 turbines, 100%, 15°F	1-hour	23.0	104	127	655	19
	4 turbines, 100%, 15°F	3-hour	13.2	53	66.2	1300	5
	4 turbines, 100%, 65°F	24-hour	2.3	17	19.3	130	15
	4 turbines, 100%, 65°F	Annual	0.1	1.4	1.5	80	2
PM10	4 turbines, 100% & cooling tower, 65	24-hour	10.8	118	128.8	50	258
	4 turbines, 100% & cooling tower, 65°F	Annual	0.7	31.7	32.4	30	108

the combustion turbines, the air pollution impacts would not cause a violation of any NO2, CO or SO2 ambient air quality standards. All of the highest impacts were calculated to be located at the hills approximately 2,300 meters (about 1.5 miles) to the south of the project site.

The project's PM10 impacts could contribute to existing violations of the state 24-hour and annual average PM-10 standards. The highest 24-hour PM10 impacts (10.8 $\mu g/m^3$) are relatively large, about 1/5 the state standard itself, located on the hills to the south of the project site. However, it should be noted that the modeling outputs show that the vast majority of 24-hour impacts are on the level of 2 $\mu g/m^3$ or less and are located in the flat terrain in the vicinity of the project site. Because of the conservatism of the air dispersion model itself, staff believes that the actual impacts from the project would be significantly less than the projected modeled impacts shown in AIR QUALITY Table 11.

The start-up circumstances of the project are such that the combustion turbines will be started sequentially, that is, there will be no simultaneous start-up of any of the four turbines. A start-up sequence of a turbine will only occur when other turbine(s) are operating at steady state or other turbines are not operating at all. Start-up circumstances can be troublesome for significant air quality impacts for the following reasons. First, emissions (particularly of NOx and CO) can be high and often uncontrolled, because emission control equipment is not operating at optimum temperature ranges. Second, low volumetric flow rates and exhaust gas temperatures can result in low exhaust plume rise and consequently higher ground level impacts. For determining the maximum 1-hour impacts, the applicant assumed that there would be two start-up sequences, each of 30 minutes, for two turbines plus the steady state operation of the two other turbines. Staff believes that this represents a reasonable worst case scenario.

The modeling results show that the highest short-term impacts on ambient NO2 and CO levels do, indeed, occur during start-up circumstances. The highest SO2 and PM10 impacts, both short-term and long term, occur during full load steady state operation. Start-up impacts on these pollutants are usually less because emissions of SO2 and PM10 are primarily a function of volume of fuel burned, and thus during start-up, much less fuel is burned than at full load, hence lower impacts.

The modeling analysis above indicates that during a project start-up scenario, the impacts from that start-up, plus background NO2 ambient levels, would result in the highest impact of the project on the 1-hour state NO2 standard. This modeling analysis reflected the use of the Ozone Limiting Method (OLM) to provide a more refined estimate of NO2 impacts.

La Paloma also provided an ISCST3 modeling analysis of the operation of the diesel fueled emergency fire water pump operation. Since the fire water pump is only planned to operate for up to one hour, the air quality impacts are assessed only for the one hour standards. The results of this modeling analysis are described in AIR QUALITY Table 12, which shows that the operation of the fire water pump will not violate any ambient air quality standards. Staff would expect comparable

results of the monthly testing of each of the four diesel emergency generators because of the similarities of the combustion engines.

AIR QUALITY Table 12
Emergency Fire Water Pump Modeling Maximum 1-Hour Impacts

Pollutant	Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard
NO2	216.9	94	310.9	470	66
CO	38.3	2941	2979.3	23,000	13
SO2	16.1	104	120.1	655	18

Notes:

Modeling was performed at both 15°F and 65°F. Highest impacts occurred at 65°F, presented here.

NO2 impact does not reflect ozone limiting analysis and are thus conservative.

SECONDARY POLLUTANT IMPACTS

The project's emissions of gaseous emissions, primarily NOx, SO2 and VOC, can contribute to the formation of secondary pollutants, namely ozone and PM10, particularly ammonium nitrate PM10 and sulfate. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, it can be said that the emissions of NOx and VOC from the LPGP do have the potential (if left unmitigated) to contribute in some unquantified way to higher ozone levels in the region.

Concerning secondary PM10 (primarily ammonium nitrate) formation, La Paloma (LPGP 1999a) submitted a conclusion from a study by Sonoma Technology, Inc. that states that the San Joaquin Valley is generally ammonia rich during the winter season when ambient PM10 levels are highest. This means that under such conditions, adding more ammonia to the ambient air will not automatically result in more ammonium nitrate formation. In the case of LPGP, La Paloma quantified the highest ammonia emissions at approximately 2,300 pounds per day based on a permitted 10 ppm ammonia slip. However, staff believes that these mass emissions will be more on the order of 200 to 500 pounds per day based on a normal 1 to 2 ppm ammonia slip. Nevertheless, the NOx emissions from the LPGP could add to ammonium nitrate (PM10) formation, since there is more than sufficient ambient ammonia available for the NOx to react with to form ammonium nitrate.

The process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there are no agency (EPA or CARB) recommended models or procedures for estimating nitrate or sulfate formation. Nevertheless, studies during the past two decades have provided data on the oxidation rates of SO2 and NOx. The data from

these studies can be used to approximate the conversion of SO2 and NOx to particulate. This can be done by using an aggregate conversion factor (typically about 0.01 to 1 percent per hour) with Gaussian dispersion models such as ISCST3. The model is run with and without chemical conversion (decay factor) and the difference corresponds to the amount of SO2 and NO2 that is converted to particulate. This approach is an over simplification of a complex process; nevertheless, given the stringency of the PM10 and the new PM2.5 standards, and the need to address interpollutant conversion rates in setting offset ratios, for interpollutant trading, as proposed by LPGP, staff believes this issue needs to be addressed.

Staff believes that the emissions of NOx from LPGP do have the potential (if left unmitigated) to contribute, to higher secondary PM10 (particularly of ammonium nitrate) levels in the region, which this modeling analysis will quantify.
Staff, as part of their cumulative modeling analysis, intends to quantify, through air dispersion modeling, and assumed NOx and SO2 conversion rates to PM10, the potential secondary PM10 impacts from the three power projects in the area currently before the Commission for licensing: La Paloma, Sunrise Cogeneration and Elk Hills. However, the appropriate conversion rate for NOx is closely tied to the District's determination of an appropriate interpollutant trading ratio of NOx for PM10. That interpollutant trading ratio will be provided by the District once the preliminary Determination of Compliance is issued.

CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future projects as part of a cumulative impacts analysis, staff needs specific information. The time in which a probable future project is well enough defined to have the information necessary to perform a modeling analysis is usually when the project applicant has submitted an application to the District for a permit. Air dispersion modeling required by the District would necessitate that the applicant develop the necessary modeling input parameters to perform a modeling analysis. Therefore, we evaluate those probable future projects in our cumulative impacts analysis that are currently under construction, or are currently under District review. Projects located up to six miles from the proposed facility site usually need to be included in the analysis.

At the time of the filing of the AFC (July 1998), La Paloma stated that there were no projects that required a District permit within a six mile radius of the project site that were either under construction or undergoing permit review. However, since July, two new energy projects have been proposed in the vicinity of the LPGP. They are the Sunrise Cogeneration and Power Project that filed an AFC with the Energy Commission in December, 1998 and the Sempra Elk Hills Project that filed an AFC in late February, 1999. Staff is performing a cumulative modeling assessment of the three projects, La Paloma, Sunrise Cogeneration and the Elk Hills Project. At the time of the preparation of this testimony (late March), staff has not completed their cumulative modeling analysis. As discussed above, one component of that analysis is the appropriate NOx to PM10 conversion rate. Until the District releases their Determination of Compliance, which will include an analysis of the appropriate

interpollutant trading ratio of NOx for PM10, staff cannot complete their cumulative modeling analysis.

VISIBILITY IMPACTS

A visibility analysis of the project's gaseous emissions is required under the Federal Prevention of Significant Deterioration (PSD) permitting program. The analysis addresses the contributions of gaseous emissions (primarily NOx) and particulate (PM10) emissions to visibility impairment on the nearest Class 1 PSD areas, which are national parks and national wildlife refuges. The nearest Class 1 areas to the La Paloma Project are the Domeland Wilderness Area 90 miles to the northeast and the San Rafael Wilderness Area 35 miles to the south. La Paloma used the EPA approved model VISCREEN to assess the project's visibility impacts. The results from the VISCREEN modeling analysis indicated that the project's visibility impacts would be below the significance criteria for contrast and perception. Therefore the project's visibility impacts on these Class 1 areas are considered insignificant.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

CONSTRUCTION MITIGATION

As discussed earlier in the applicable LORS section, there are a series of District rules under Regulation 8 that limit fugitive dust during the construction phase of a project. Those rules require the use of chemical stabilizing agents and dust suppressants or gravel areas on site, and the wetting or covering of stored earth materials on site. These rules also require that the transporting of borrow fill dirt material be wetted, be covered, or sufficient freeboard be allowed. They also encourage, although do not require, the use of paved access aprons, gravel strips, wheel washing or other means to limit mud or dirt carry-out onto paved public roads. Because they are required by District rules, La Paloma will employ appropriate fugitive dust mitigation measures to limit their construction related PM10 emissions.

To minimize combustion emissions such as NOx, CO and PM10, which is not required by District rules, La Paloma is proposing to require that contractors properly maintain vehicle/equipment engines to control exhaust emissions.

OPERATIONS MITIGATION

The LPGP's air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NOx emissions, La Paloma proposes to use dry-low NOx combustors in the CTGs. In addition, on at least three of the HRSGs, an ammonia injection grid will be used in conjunction with a Selective Catalytic Reduction system. On the fourth HRSG, La Paloma intends to install either an ammonia injection/SCR system or the SCONOx^{TM} emissions control technology.

To reduce CO and VOC emissions, La Paloma proposes to use a combination of good combustion and maintenance practices, along with an oxidizing catalyst located in the HRSG. PM10 emissions will be limited by the use of a clean burning fuel (natural gas) and the efficient combustion process of the CTGs. The use of natural gas as the only fuel will limit SO2 emissions.

COMBUSTION TURBINE

Dry Lo-NOx Combustors

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx formed during combustion. Because of the expense and efficiency losses due to steam or water injection in the combustor cans to reduce combustion temperatures and the formation of NOx, CTG manufacturers are presently choosing to limit NOx formation through the use of dry low-NOx technologies. The ABB version of the dry low-NOx combustor is the Sequential Combustion System. Unique to this design is that the fuel/air mixture is ignited twice in two independent annular combustors. The natural gas/air mixture is mixed and combusted in the first combustor can. The hot gases are then directed to a second combustor can, where additional fuel is added and a second combustion process takes place.

In this process, firing temperatures remain somewhat low, thus minimizing NOx formation, while thermal efficiencies remain high. At steady state CTG loads greater than 40 percent load, NOx concentrations entering the HRSG are 25 ppm corrected to 15 percent O2. CO concentrations are more variable, with concentrations greater than 100 ppm at 50 percent load, dropping to 5 ppm at 100 percent load.

FLUE GAS CONTROLS

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed in the HRSGs. La Paloma is proposing two catalyst systems, a selective catalytic reduction system to reduce NOx, and an oxidizing system to reduce CO. A third type of catalyst system, known as SCONOx^{TM}, is also being proposed for installation in one of the four HRSGs, in lieu of the SCR and oxidizing catalyst in that HRSG.

Selective Catalytic Reduction (SCR)

Selective catalytic reduction refers to a process that chemically reduces NOx by injecting ammonia into the flue gas stream over a catalyst in the presence of oxygen. The process is termed selective because the ammonia reducing agent preferentially reacts with NOx rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine typically range from 950 to 1100^{o}F.

Catalysts generally operate between 600 to 750°F (ARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled. At temperatures lower than 600°F, the ammonia reaction rate may start to decline, resulting in increasing ammonia emissions, called ammonia slip. At temperatures above about 800°F, depending on the type of material used in the catalyst, damage to some catalysts can occur. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or a noble metal are also used. These newer catalysts (versus the older alumina-based catalysts) are resistant to fuel sulfur fouling at temperatures below 770°F (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of NO_x to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

La Paloma proposes to use a combination of the dry low-NO_x combustors and SCR system to produce an NO_x concentration exiting the HRSG stack of 2.5 ppm, corrected to 15 percent excess oxygen averaged over a 3-hour period.

Oxidizing Catalyst

To reduce the turbine carbon monoxide (CO) emissions, La Paloma proposes to install an oxidizing catalyst, which is similar in concept to catalytic converters used in automobiles. The catalyst is usually coated with a noble metal, such as platinum, which will oxidize unburned hydrocarbons and CO to water vapor and carbon dioxide (CO2). The CO catalyst is proposed to limit the CO concentrations exiting the HRSG stack to 10 ppm, corrected to 15 percent excess oxygen, over all turbine load ranges. However, a 10 ppm CO concentration is guaranteed by ABB without an oxidizing catalyst at turbine loads above 75 percent. Therefore, the addition of an oxidizing catalyst system will reduce actual CO concentrations to 2 ppm or less (assuming an 80 percent efficient design) when the CTGs operate at loads greater than 75 percent.

It is at loads less than 75 percent that CO concentrations rise significantly and therefore require the use of an oxidizing catalyst to meet the goal of 10 ppm.

SCONOx™

A new and promising flue gas emissions control technology is the SCONOx™ catalytic absorption system manufactured by Goalline Environmental Technologies. SCONOx™ uses a single precious metal catalyst for the removal of NOx and CO without the need of a reagent, such as ammonia. The catalyst is installed in the HRSG, much like an SCR system, and operates in a temperature range of 300°F to 700°F. CO is oxidized by the catalyst to CO2 and is then emitted out of the HRSG stack. NOx emissions are absorbed onto the catalyst by means of a potassium carbonate coating on the catalyst. A series of mechanically operated dampers then isolates a catalyst block assembly and a dilute hydrogen (less than 4 percent) reducing gas is introduced and the absorbed NOx is converted to elemental nitrogen. The dampers are then opened, the elemental nitrogen passes out the

HRSG stack, and the regenerated catalyst block is used again to absorb NOx and oxidize CO.

The experience with SCONOx™ at a commercial level is limited to the Sunlaw Federal Cogeneration facility using a GE LM2500 (approximately 34 MW) located in Vernon, in the Los Angeles Basin. This project has been in operation since December 1996 and has routinely operated at NOx levels of 2 ppm.

ABB Environmental Services, part of the same ABB company that manufacturers the combustion turbine, has agreed to be the licensee of the SCONOx™ technology for power projects greater than 100 MW. Because of ABB's strong financial position, its technical expertise and their reputation as a large, power industry-related company, La Paloma is hoping to install a SCONOx™ system on one of the four HRSGs. However, the availability of SCONOx™ will depend on the commercial availability of the technology from ABB, so its use on the LPGP at this time is still an uncertainty.

COOLING TOWER

Cooling tower drift consists of small water droplets, which contain particulate matter that originate from the total dissolved solids in the circulating water. To limit these particulate emissions, drift eliminators are installed in the cooling tower to capture these water droplets. La Paloma intends to use drift eliminators on the cooling tower, with a design efficiency of 0.0006 percent. This is a very high level of efficiency for cooling tower drift eliminators. Similar cooling tower designs have been used successfully by a number of other projects licensed by the Energy Commission in recent years.

EMISSION OFFSETS

District Rule 2102, Section 4.2, requires that La Paloma provide emission offsets, in the form of banked Emission Reduction Credits (ERC), for the project's emissions increases of NOx, SO2, VOC and PM10. La Paloma has secured a number of offsets through option agreements and are still negotiating for others. A summary of the amounts of credits secured and under negotiation, compared to the LPGP total emissions liability, is shown in AIR QUALITY Table 13. Offsets for the project's CO emissions are not required since the project will not cause any violations of any CO standard and the area currently does not experience any violations of any CO standard.

A significant portion of the offsets, that were obtained from Aera Energy LLC in western Kern County were generated for the LPGP from the shutdown of numerous steam generators used in thermal enhance oil recovery, the conversion of crude oil fired steam generators to natural gas fired, the retro-fit of a number of gas-fired steam generators with low-NOx burners, and the conversion of heavy oil test stations to pressurized tanks to limit VOC emissions.

AIR QUALITY Table 13
Emissions Offsets Balance

	NOx	SO2	VOC	PM10
AERA – contracted	433.3	14.2	50.0	41.7
AERA – under negotiation	29.2	40.8	--	--
Confidential source - under negotiation	104.9	--	--	--
TOTAL	567.3	55.0	50.0	41.7
LPGP's Annual Emissions	289.42	61.0	49.85	284.47
surplus(+) - - - shortfall (-)	+277.88	-6.0	+0.15	-242.77

La Paloma plans to use their "excess" in NOx ERCs to offset most of their PM10 liability. The reason that La Paloma is planning to use NOx credits for PM10 liability is because there are very few PM10 credits available while there are considerable Nox credits available. The District rules allow for such inter-pollutant trading. Staff agrees that based on the relationship of NOx contributing to secondary PM10 formation of ammonium nitrate, especially during the high ambient PM10 winter season, that NOx reductions for PM10 increases is an appropriate mitigation measure.

There may be some debate as to the appropriate inter-pollutant trading ratio. La Paloma proposes a ratio of 1.1 pound NOx for 1 pound PM10. Again, the District will have to make a finding in the PDOC as to whether that ratio is sufficient. In addition, EPA may comment on the inter-pollutant trading ratio when the PDOC is released. The California Air Resources Board has given guidance (ARB 1988) that a ratio of 1 pound of NOx for 1 pound of PM10 would be permissible. The inter-pollutant trading ratio will likely be resolved when the SJVUAPCD issues their Final DOC. Staff has agreed to interpollutant trading of gaseous emissions for PM10 liability on previous siting cases (Carson and Crockett) at a ratio of 1:1.
La Paloma is currently in negotiations with a second offset provider, which La Paloma wishes to keep confidential at this time, to provide additional NOx offsets.

As Table 13 shows, La Paloma has secured or plans to secure sufficient ERC to offset the project's NOx and VOC emissions. In fact, La Paloma plans to secure a considerable ERC surplus of NOx credits for use in an interpollutant trade of NOx credits for their PM10 emissions liability. Along with the SO2 offsets shown in Table 15, La Paloma will have to secure an additional 6 tons of SO2 offsets to fully offset their project.

The figures for the annual emissions liability and the sources and amounts of offsets should be considered preliminary, as refinements and adjustments to both the emissions and the offsets are continuing.

ADEQUACY OF PROPOSED MITIGATION

CONSTRUCTION MITIGATION

La Paloma is required to comply with the District Regulation 8 for limiting fugitive dust emissions during construction. In addition, they will require that all large diesel construction equipment used by contractors be in proper operating condition and their engines appropriately tuned. Staff believes that additional measures are necessary to mitigate potential construction impacts (refer to staff proposed mitigation below).

OPERATIONS MITIGATION

EMISSION CONTROLS

La Paloma has proposed, in their opinion, all practical and technically feasible mitigation measures to limit emissions from the GT-24 combustion turbines to 2.5 ppm over a 3-hour average. This is less stringent than a recent BACT finding made by EPA on the High Desert project which the Commission is currently evaluating. EPA sent a letter, dated January 15, 1999, commenting on the issuance of the Preliminary Determination of Compliance by the Mojave Desert Air Quality Management District for the High Desert Power Project (USEPA 1999). In that letter, EPA states that the NOx concentration of 2.5 ppm shall be averaged over one hour, not three hours. Depending on how the San Joaquin Valley Unified Air Pollution Control District deals with the issue in their upcoming Preliminary Determination of Compliance for the LPGP will determine whether the averaging period will become an issue for the project.

Another potential issue is BACT for the CO emission concentrations from the project. La Paloma is proposing a BACT level of 10 ppm with the use of an oxidation catalyst. In the same EPA comment letter (USEPA 1999), the EPA states that BACT for CO for a combustion turbine project should be 4 ppm. Based upon data provided by La Paloma (Appendix K-5), it appears that the LPGP could meet the 4 ppm level when the GT-24 operates at loads above 70 percent. At loads below 70 percent, CO concentrations rise dramatically and it is unlikely that 4 ppm can be met at loads down to 50 percent, which La Paloma would like to operate their turbines on occasion. The issue of what is CO BACT for the project (10 ppm vs. 4 ppm) will likely have to be resolved after the District issues their PDOC and the EPA subsequently comments.

La Paloma's position on VOC concentrations of less than 1.0 ppm appears consistent with the latest position (USEPA 1999) that VOC BACT (and federal LAER) should be 1.0 ppm.

La Paloma's use of drift eliminators with an efficiency of 0.0006 percent represent the state-of-the-art of drift eliminator design. To our knowledge, commercially available drift eliminators with even higher efficiency, which could further reduce the cooling tower's PM10 emissions, are not available.

La Paloma has proposed an offsets package that, to date, is still being developed and refined. As Table 15 illustrates, they have provided a considerable surplus of banked ERC for NOx. Presently, there still is a shortfall of offsets for the project's emission liability of SO2 and PM10. It is our understanding that La Paloma will provide the necessary SO2 credits to fully offset the SO2 liability.

At the time of the preparation of this testimony (late March), the District has not released their Preliminary Determination of Compliance. Therefore staff cannot describe what the NOx to PM10 interpollutant trading ratio is or whether sufficient emission offsets are being provided by La Paloma to satisfy the District's offset requirements. Therefore, at this time, staff can only conclude that the project does not have sufficient emission offsets to fully mitigate the potential impacts on the PM10 standards or its contribution of SO2 emissions to secondary PM10 formation.

STAFF PROPOSED MITIGATION

CONSTRUCTION MITIGATION

As stated above, there are a number of rules in the District's Regulation 8 that will minimize fugitive dust emissions. Those rules allow for some latitude and flexibility as to how they will demonstrate compliance. La Paloma is obligated to meet the requirements of these rules, and staff believes that they should demonstrate specifically how they intend to meet the requirements of these rules and minimize fugitive dust emissions during construction. Staff proposes that prior to the commencement of construction, that La Paloma provide a fugitive dust maintenance plan that specifically spells out the mitigation measures that La Paloma will employ to limit fugitive dust during construction and comply with District Regulation 8.

The modeling assessment discussed earlier shows that the combustion sources used for heavy construction have the potential for causing significant air quality impacts. The most feasible mitigation measure to limit these emissions is to have well maintained and properly tuned internal combustion engines. La Paloma has proposed that they will require contractors to maintain their vehicles and equipment to limit exhaust emissions. To enforce this, staff proposes that La Paloma require that the contractors maintain records of proper engine maintenance and tune-ups for the major combustion equipment, such as the bulldozers, backhoes, compactors, loaders, motor graders, trenchers, cranes, dump trucks and other heavy duty construction related trucks; and have the appropriate maintenance records available on-site for inspection. Staff proposes that as a part of a contractor's bid, that the contractor provide records that his equipment has been properly maintained according to the engine manufacturers' specifications.

OPERATIONS MITIGATION

The LPGP, as currently proposed, is short of ERCs for their emissions of SO2 and PM10. However, we understand that La Paloma intends to provide sufficient ERC to fully offset these pollutants. Therefore, staff is not proposing any additional operational mitigation measures to the project at this time.

COMPLIANCE WITH LORS

FEDERAL

The LPGP is currently undergoing review by EPA on the Prevention of Significant Deterioration (PSD) permit. Based on recent conversations with EPA staff (Ruhl 1999), the EPA has not identified any significant issues in their evaluation of the PSD application.

STATE

The project, with the anticipated full mitigation (offsets) that will be necessary to secure an Determination of Compliance from the SJVUAPCD, should comply with Section 41700 of the California State Health and Safety Code.

LOCAL

The District is continuing its review of the project. Since the District has not completed their review of the application, a finding of compliance with the District's rules and regulations cannot be made at this time. The District intends to issue its preliminary Determination of Compliance (DOC) by the end of March, 1999. It will be subject to a 30-day public review, after which the District will prepare the final DOC. At the time of this analysis, the PDOC has not been issued. Therefore, staff , cannot yet conclude that the project will comply with the District's rules and regulations, nor can itrecommend conditions of certification for adoption by the Commission.

CONCLUSIONS AND RECOMMENDATIONS

The La Paloma project's air quality impacts from directly emitted PM10 and of the ozone precursor emissions of NOx and VOC and PM10 precursors of NOx and SO2 could be significant if left unmitigated. Although La Paloma intends to reduce emissions to the extent feasible and provide emission offsets for their NOx, VOC, SO2 and PM10 emissions, sufficient emissions offsets for SO2 and PM10 have not yet been provided. The project's SO2 (as a precursor to PM10) and directly emitted PM10 impacts therefore remain significant and, it this time, unmitigated.

Because the District has not provided their Preliminary Determination of Compliance at the time of the preparation of this analysis, staff cannot conclude whether the project will comply with the District's Rules and Regulations. In addition, La Paloma is continuing to refine their offset proposal and provide additional ERC.

Staff is continuing its analysis of the cumulative air quality impacts of the three Kern County power plant projects currently before the Commission: La Paloma, Sunrise Cogeneration, and Elk Hills. However, the analysis cannot be completed until the District has determined the appropriate interpollutant offset trading ratio and thus the appropriate NOx to PM10 conversion rate that will be used in the cumulative modeling analysis.

Because the LPGP, as currently proposed, may create a significant unmitigated air quality impact, and because the District has not yet issued its Determination of Compliance, including proposed conditions of certification, staff cannot recommend certification of the project at this time.

REFERENCES

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LPGC 1998c. Supplement to the Application for Certification. November 1998.

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SJVUAPCD, 1999. San Joaquin Valley Unified Air Pollution Control District. Letter from Thomas Goff, Permit Services Manager to Marc Pryor, Siting Project Manager, California Energy Commission. January 12.

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PUBLIC HEALTH

Testimony of Obed Odoemelam

INTRODUCTION

Operating the proposed La Paloma Generating Project (LPGP) would create combustion products and possibly expose workers and the general public to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The issue of possible worker exposure is addressed in the **Hazardous Materials Management** and **Worker Safety and Fire Protection** sections of this Preliminary Staff Assessment (PSA). The purpose of this public health analysis is to determine whether a significant health risk would result from public exposure to these chemicals and the combustion by-products routinely emitted during project operations.

The exposure of primary concern in this section is to pollutants for which no air quality standards have been established. These are known as the noncriteria pollutants, or toxic air pollutants. Those for which ambient air quality standards have been established are known as criteria pollutants. These criteria pollutants are identified in this section (along with regulations for their control) because of their usually significant contribution to the total pollutant exposure in any given area. Furthermore, the same control technologies may be effective for the control of both types of pollutants as emitted from the same source. Compliance with the applicable standards is discussed in the **Air Quality** section of this PSA.

LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

The Clean Air Act of 1970 (42 U.S.C., section 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States Environmental Protection Agency (EPA) for the major air pollutants: nitrogen dioxide, ozone, sulfur dioxide, carbon monoxide, sulfates, particulate matter with a diameter of 10 micron or less (PM10) and lead. The act required states to adopt plans to ensure compliance by 1982. These plans are known as the State Implementation Plans (SIPs). The EPA revised the ozone standard and the particulate matter standard in 1997 to differentiate between PM10 and particulate matter with a diameter of 2.5 micron or less (PM2.5). Such particulate matter may serve as a source of exposure to both criteria and noncriteria pollutants.

STATE

California Health and Safety Code, section 39606 requires the California Air Resources Board (CARB) to establish California's ambient air quality standards to reflect the California-specific conditions that influence its air quality. Such standards have been established by the CARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The same

biological mechanisms underlie some of the health effects of most of these and the noncriteria pollutants. The California standards are listed together with the corresponding federal standards in the **Air Quality** section.

California Health and Safety Code, section 41700 states that "(n)o person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause or have a natural tendency to cause injury or damage business or property."

The California Health and Safety Code, section 39650 mandates California Environmental Protection Agency (Cal/EPA) to establish safe exposure limits for toxic, noncriteria air pollutants and identify the best available methods for their control. These laws also require that the new source review rules for each air district include regulations establishing procedures to control the emission of these pollutants. The toxic emissions from natural gas combustion are listed in CARB's April 11, 1996 California Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines. Cal/EPA has developed cancer potency estimates for assessing their related cancer risks at specific exposure levels. For the noncarcinogens, Cal/EPA established specific no-effects levels (known as reference exposure levels) for assessing the likelihood of health symptoms at specific exposure levels. Such health effects would be considered likely only when exposure exceeds these reference levels. Staff uses these Cal/EPA potency estimates and reference exposure values in its health assessments.

California Health and Safety Code, section 44300 et seq., requires facilities which emit large quantities of criteria pollutants and any amount of noncriteria pollutants to provide the local air district an inventory of toxic emissions. Such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risk involved. The CARB and the San Joaquin Unified Air Pollution Control District (District) will ensure implementation of these requirements for the proposed project. The applicant intends to comply with all applicable requirements (LPGP 1998a, AFC p. 5.16-16).

LOCAL

The San Joaquin Valley Unified Air Quality Management District has no specific rules implementing Health and Safety Code section 44300. It does, however, require the results of a health risk assessment as part of the application for the Authority to Construct (ATC). La Paloma has complied with this requirement.

SETTING

According to information from the applicant (LPGP 1998a, AFC pp. 5.16-1 and 15.16-2), the toxic air contaminants from the project will be emitted into a mostly agricultural and light industrial area, with the nearest residence located approximately 1.6 miles from the project site. The potential impact area includes

the community of McKittrick, as well as unincorporated areas of Kern County with an average population density of 4 per square mile, according to 1990 census data.

There are several facilities with sensitive receptors within the six-mile radius of potentially significant impacts. The applicant has provided information identifying each facility, together with its location relative to the proposed project (LPGP 1998a, AFC p. 5.16-9). Such sensitive receptors include children, the elderly and the sick who are usually more susceptible than the general population to the effects of environmental pollutants. Extra consideration is given to possible effects in such individuals in establishing exposure limits for environmental pollutants.

IMPACT ASSESSMENT

Any impacts from this type of project would be mainly associated with pollutants originating from the combustion turbines and the cooling towers. Thus, exposure to the surrounding population is estimated through air dispersion modeling. After estimating the exposure levels, staff assesses whether these exposure estimates are below the applicable reference exposure levels in the case of noncancer effects, or below levels at which any possible cancer risks are considered insignificant by regulatory agencies in the case of cancer-causing (or carcinogenic) pollutants. The procedure for evaluating the potential for these cancer and noncancer health effects is known as a health risk assessment process and consists of the following steps:

- a hazard identification step in which each pollutant of concern is identified along with the types of health effects it can cause;
- a dose-response assessment step in which the relation between the magnitude of exposure and the probability of effects is established;
- an exposure assessment step in which the possible extent of pollutant exposures from a project is established for all possible pathways by dispersion modeling;
- a risk characterization step in which the nature and often the magnitude of the possible human health risk is assessed and presented.

HEALTH EFFECTS ASSESSED

Health risks associated with a project can result from high-level exposure which creates immediate-onset (acute) effects, or from prolonged low-level exposure which creates chronic effects. Since noncancer effects are assumed to result after exposure above specific thresholds, an analysis of the potential for these effects will include consideration of background levels in the area. Such background measurements are usually possible for the major (criteria) pollutants but not the more reactive noncriteria pollutants which are generally emitted at much lower levels. For projects of this type, acute effects could occur only during major accidents and are not expected from routine operations when emissions are much lower. Long-term, chronic exposures are, therefore, of greater concern than the

short-term effects in assessing possible public health impacts. Such chronic effects may be related to cancer or health effects other than cancer.

The method used by regulatory agencies to assess the significance of noncancer health effects is known as the hazard index method and is used for both acute and chronic effects. In this method, a hazard index is calculated for the individual pollutants by dividing projected exposure by the reference level for that pollutant. A hazard index of less than 1.0 suggests that such effects would be unlikely. A value of more than 1.0 would suggest a likelihood of effects. The individual indices are then added together to obtain an aggregate index value for the project in question. A total index of less than 1.0 would suggest a potential lack of effects from all pollutant exposures considered. A value of more than 1.0 would suggest a potential for significant effects.

POTENTIAL CANCER RISK

Cancer from carcinogenic exposure usually results from biological effects at the molecular level. Since such effects are currently assumed possible from every exposure to a carcinogen, the risk of cancer is generally considered by staff and other regulatory agencies as more sensitive than the risk of noncancer health effects, for assessing the environmental acceptability of a source of both carcinogens and noncarcinogens. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process. For any source of concern, the potential risk of cancer is obtained by multiplying the exposure estimate by the potency values for the individual carcinogens involved. The total project-related cancer risk is then obtained by adding together the risk values obtained for the individual carcinogens.

STAFF'S SIGNIFICANCE CRITERIA

Staff considers a potential cancer risk of one in a million as the threshold of significance for sources of environmental carcinogens. Above this threshold, further mitigation would be recommended. For noncarcinogenic pollutants, significant health impacts would be considered unlikely (as do other regulatory agencies) when the hazard index estimate is less than 1.0. If more than 1.0, such impacts would be considered likely.

PROJECT SPECIFIC IMPACTS

The applicant conducted their health risk assessment for the project according to procedures specified in the October 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines for sources of this type. Results of this assessment have been provided to staff, along with documentation of the assumptions used (LPGP 1998a, AFC, pp. 5.16-2 through 5.16-14). Such documentation was provided with regard to the following:

- pollutants considered;
- emission levels assumed for the pollutants involved;
- dispersion modeling used to estimate potential exposure levels;
- exposure pathways considered;

- the cancer risk estimation process;
- hazard index calculation; and
- characterization of project-related health risk estimates.

Staff has found these assumptions to be accurate and concurs with the applicant's findings with regard to the numerical health risk estimates expressed, either in terms of the hazard index for each noncarcinogenic pollutant, or a cancer risk for estimated levels of the carcinogenic pollutants. Background noncriteria pollutants were not measurable as staff would expect for the type of area involved. As a result, only the project-related emissions were considered in calculating the hazard index values involved. These analyses were conducted to determine the potential for acute and chronic effects on body systems such as the liver, central nervous system, the immune system, kidneys, the reproductive system, the skin and the respiratory system.

The following pollutants were considered for potential to produce noncancer effects: ammonia, acetaldehyde, acrolein, benzene; 1,3 butadiene; formaldehyde, naphthalene, toluene, xylenes, manganese, propylene oxide and polycyclic aromatic hydrocarbons (PAHs). The following were considered with regard to a possible cancer risk: acetaldehyde, benzene, 1,3 butadiene, formaldehyde, PAHs and propylene oxide.

Hazard index values of less than 1.0 were calculated for all the noncarcinogenic pollutants from the turbines to be used. This suggests that significant noncancer health effects would be unlikely during operations from exposure to the noncriteria pollutant considered in this analysis.

The highest cancer risk was estimated to be 0.017 in a million. This represents the risk to an individual exposed at the highest possible levels to all the carcinogenic pollutants from the project. This risk value is much below the one in a million level considered significant by staff with regard to the possibility of cancer from sources of environmental carcinogens.

CUMULATIVE IMPACTS

In addition to the La Paloma project, the Commission is reviewing the Elk Hills and Sunrise Cogeneration power plant projects, which are proposed to be constructed and operated in western Kern County. The three projects, all of which will burn natural gas, are located about 8 miles apart. Staff has reviewed the potential public health impacts from each of these projects to determine the potential cumulative impacts that could result from their combined operation.

When toxic pollutants are emitted from multiple sources within a given area, the cumulative, or additive, impacts of such emissions could, in concept, lead to significant health impacts within the population, even when such pollutants are emitted at insignificant levels from the individual sources involved. Experience has shown, however, that the peak impacts of such toxic pollutants are normally localized within relatively short distances from the source. Toxic pollutant emission levels beyond the point of maximum impact normally fall within existing ambient

background levels. Potentially significant cumulative impacts are only expected in situations where new sources are located adjacent to each other. The highest impact levels from each of the three projects being evaluated are approximately one mile or less from the emissions source. Therefore, given the approximate 8 mile distance between each of the projects, their combined operation will not cause or contribute significantly to a public health impact from toxic pollutant emissions.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that the project will not pose a significant public health risk to the surrounding population. Therefore, no Public Health Conditions of Certification are proposed.

REFERENCES

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WORKER SAFETY AND FIRE PROTECTION

Testimony of Ellen Townsend-Smith

INTRODUCTION

Industrial workers use process equipment and hazardous materials on a daily basis. Accidents involving relatively small amounts of material can result in serious injuries to workers. Worker protection measures can include special training, protective equipment and procedural controls. The employer must also comply with applicable laws, ordinances, regulations, and standards (LORS) to protect workers. This Worker Safety and Fire Protection analysis assesses the completeness and adequacy of the measures proposed by the La Paloma Generating Company, LLC (La Paloma) to comply with applicable health and safety standards and other reasonable requirements (Title 20, California Code Regulations, section 1743), and to draw conclusions about the compliance of the proposed project with applicable LORS (Title 20, California Code Regulations, section 1744). These standards are designed to protect the health and safety of workers during construction and operation of the facility, and to establish adequate fire protection and emergency response procedures.

Staff has reviewed La Paloma's Application for Certification (AFC) to determine whether La Paloma has proposed adequate measures to:

- comply with all applicable (LORS);
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

Unless features of the project present unusual industrial safety or fire protection problems, staff believes that compliance with applicable LORS will be sufficient to ensure worker safety and fire protection.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

- Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.);

- Occupational Safety and Health Administration Safety and Health regulations (29 CFR §§ 1910.1 - 1910.1500).

Approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the federal requirements found in Part 29, Code of Federal Regulations, sections 1910.1 - 1910.1500 (29 CFR §§ 1952.170 - 1952.175)

STATE

Title 8, California Code of Regulations, section 450 et seq. (Applicable requirements of the Division of Industrial Safety, including Unfired Pressure Vessel Safety Orders, Construction Safety Orders, Electrical Safety Orders, and General Industry Safety Orders).

California Building Code, Title 24, California Code of Regulations, section 501 et seq. The California Building Code is designed to provide minimum standards to safeguard human life, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, etc. of buildings and structures.

LOCAL

Uniform Fire Code (UFC). The uniform fire code contains provisions necessary for fire prevention and information about fire safety, special occupancy uses special processes, and explosive, flammable, combustible and hazardous materials.

Uniform Fire Code Standards. This is a companion publication to the UFC and contains standards of the American Society for Testing and Materials and of the National Fire Protection Association.

SETTING

The LPGP is located on a site previously used for oil production in western Kern County. Offsite fire protection is provided by the Kern County Fire Department (KCFD). **WORKER SAFETY AND FIRE PROTECTION Table 1** lists the fire stations located closest to the LPGP site and their response time capabilities, equipment and staffing levels. Note that the station with the greatest service capabilities, which would likely be needed to respond to a major industrial accident or fire at the site, is located the farthest away from the proposed project site (Dickson 1999).

WORKER SAFETY AND FIRE PROTECTION Table 1
Fire Station/Fire Protection Capabilities

Station	Response Time	Equipment	Number of Firefighters
Station 24 23246 Second Street McKittrick, CA	4 minutes	1997 Pierce Saber Engine	2
Station 25 100 Mirasol Are Buttonwillow, CA	16 minutes	1990 Beck Engine	2
Station 23 100 Broadway Fellows, CA	20 minutes	1997 Pierce Saber Engine	2
Station 21 303 10th Street Taft, CA	25 minutes	1990 Beck Engine	3
Landco Station 3000 Landco Dr. Bakersfield, CA (HAZMAT TEAM)	45 –50 minutes	Engine; Hazmat response Vehicle Technical Rescue Vehicle	5

IMPACTS

PROJECT SPECIFIC IMPACTS

FIRE PROTECTION

To determine the project's impacts on fire protection, staff reviewed the information provided in the AFC regarding available fire protection services and equipment (LPGP 1998a, §§ 3.4.10 and 5.17.2.1.2. The project will include the following fire protection equipment: yard hydrants, hose stations, water spray and sprinkler systems, a carbon dioxide fire protection system, deluge spray system, smoke detectors, combustible gas detectors and fire extinguishers. La Paloma will be required to provide final diagrams and plans to staff and the Kern County Fire Protection District, prior to construction and operation of the project, to confirm the adequacy of these fire protection measures. The LPGP facility will have onsite fire protection systems and will also be supported by local fire protection services, as described in Table 1. Please refer to conditions of certification **SAFETY-1** and **SAFETY-2** that describe the requirements for the construction and operation Safety and Health Programs. The KCFD has evaluated the potential impacts of the proposed project on their service capabilities, as described below under **CUMULATIVE IMPACTS**.

WORKER SAFETY

Industrial environments are dangerous. Workers may be exposed to chemical spills, hazardous wastes, fires, confined space entry/egress problems and to moving equipment. It is important for La Paloma to have well-defined policies,

procedures, training, hazard recognition and control at their facility to minimize such hazards and to protect workers. The applicant provided an outline that will be expanded on prior to construction and operation, refer to **SAFETY-1** and **SAFETY-2**.

CUMULATIVE IMPACTS

There could potentially be five power plants built in western Kern County, including the La Paloma, Sunrise, Elk Hills, Midway Sunset, and Pastoria projects. Staff has completed a visual inspection of the proposed project sites and the KCFD responding fire stations. Staff has confirmed that some of the structures proposed to be located on the proposed project sites can average more than 50 feet taller than the largest buildings in the communities of Buttonwillow, Elk Hills, and Taft. The KCFD has adequate resources to respond to emergencies that consist of structures that are approximately one story high only. Because of the height of some of the power plant equipment and structures, the Department has identified a need for additional resources, such as a ladder truck for elevated hose streams, and high-angle and confined space rescue capabilities to adequately serve the proposed projects.

Staff held a meeting with the KCFD on March 3, 1999 to discuss the potential impacts of the proposed projects on the Department's service capabilities. Staff subsequently received a letter from the Department, dated March 18, 1999, which discusses the potential service impacts of the proposed projects on the Department. The letter also identifies additional equipment and staffing required for the Department to provide fire protection and emergency response services to the power plant projects.

The letter states:

"Both of the County's two ladder trucks are located in the Metropolitan Bakersfield area: the ladder truck closest to the power plants is located about 40 miles away. The operations and structures associated with the thermal electric power plants results in increased incident complexity and access problems which our typical fire engine is not equipped to handle (both in terms of number of personnel and specialized equipment) without the back up of a ladder truck. The distance between the power plant locations and the metropolitan Bakersfield area is such that is not acceptable to dispatch an existing ladder truck for emergency response to Western Kern county because of excessive time delay. The potential needs for elevated hose streams, high-angle and confined space rescue capability can only be addressed through the addition of a ladder truck; it will provide the appropriate fire apparatus to get the specialized personnel and equipment to the scene of incidents in a timely manner and provide the elevated platform for hose streams and rescue access as needed." (Dickson 1999)

MITIGATION

La Paloma will prepare separate construction and operation "Safety and Health Programs" to ensure compliance with applicable LORS during the construction or operation phases of the project.

As mitigation for the direct and cumulative impacts to fire protection services, the KCFD is proposing that the project applicants provide the funding for the purchase of a ladder truck that will be located at Station 21 in Taft, and the ongoing funding for staffing of the ladder truck, including High Angle and Confined Space Specialist Technicians that would be trained to operate the ladder truck. Staffing of the ladder truck for three work shifts would include a captain, an engineer and a firefighter. Refer to the **Socioeconomics** Final Staff Assessment Cumulative Impacts Section and the **Socioeconomics** Proposed Condition of Certification **SOCIO 2** for a discussion of staff's proposed mitigation on measures to address the needs of the KCFD.

CONSTRUCTION SAFETY AND HEALTH PROGRAM

The Construction Safety Orders found in Title 8, California Code of Regulations contain health and safety requirements promulgated by California Occupational Safety and Health Administration (Cal/OSHA) that are applicable to the construction phase of the project (Cal Code Regs., tit. 8, § 1500 et seq.). The various plans required by the regulations are incorporated in the project Construction Safety and Health Program, the major elements of which include:

- Construction Injury and Illness Prevention Program (IIPP) (Cal. Code Regs., tit. 8, § 1509);
- Construction Fire Protection and Prevention Plan (Cal. Code Regs., tit. 8, § 1920);
- Personal Protective Equipment Program (Cal. Code Regs., tit. 8, §§ 1514 - 1522; and §§ 3401 - 3411).

In addition, the requirements of the Electrical Safety Orders (Cal. Code Regs., tit. 8, and §§-2299 - 2974) and Unfired Pressure Vessel Safety Orders (Cal. Code Regs., tit. 8, §§ 450 - 544) may be applicable to the project.

La Paloma provided adequate outlines in the AFC for each of the above programs and plans, and prior to construction of the facility, will provide detailed programs and plans in accordance with condition of certification **SAFETY-1**.

OPERATION SAFETY AND HEALTH PROGRAM

During the operation phase of the project, many Electrical Safety Orders (Cal. Code Regs., tit. 8, and §§-2299 - 2974) and Unfired Pressure Vessel Safety Orders (Cal. Code Regs., tit. 8, §§ 450 - 544) will be applicable. In addition, the Division of Industrial Safety has also promulgated regulations applicable solely to operations. These are contained in the General Industry Safety Orders (Cal. Code Regs., tit. 8, § 3200 et seq.). La Paloma will incorporate these requirements into its Operation Safety and Health Program, the major elements of which include:

- Injury and Illness Prevention Program (Cal. Code Regs., tit. 8, § 3203)
- Emergency Action Plan (Cal. Code Regs. tit. 8, § 3220)
- Fire Prevention Plan (Cal. Code Regs., tit. 8, § 3221)

- Personal Protective Equipment Program (Cal. Code Regs., tit. 8, §§ 3401 - 3411)

La Paloma provided adequate outlines for each of the programs and plans in the AFC and will provide detailed programs and plans in accordance with condition of certification **SAFETY-2**.

SAFETY AND HEALTH PROGRAM ELEMENTS

La Paloma has provided proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. Below is a list of the major items required in both Safety and Health Programs.

INJURY AND ILLNESS PREVENTION PROGRAM (IIPP)

La Paloma has provided an adequate draft outline for an Injury and Illness Prevention Program (IIPP) (La Paloma 1998a). La Paloma will need to submit an expanded Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to both construction and operation of the project.

Cal/OSHA will review and provide comments on the IIPP as the result of an onsite consultation at the request of La Paloma, during which a Cal/OSHA representative will complete a physical survey of the site, analyze the work practices, and point out those practices that are likely to result in illness or injury. The on-site consultation will give Cal/OSHA an opportunity to evaluate La Paloma's IIPP and apply it directly to activities taking place on-site (Cunningham 1998).

EMERGENCY ACTION PLAN

Title 8, California Code of Regulations, section 3220 contains the requirements for an Emergency Action Plan. The AFC contains a satisfactory outline for an emergency action plan (LPGP 1998a, pg. 5.17-12). The outline lists the following features: fire and emergency reporting procedures, evacuation procedures, and a Spill Prevention/Control and Countermeasures Plan. Staff proposes condition of certification **SAFETY-2**, which requires La Paloma to submit a final Operation's Emergency Action Plan to Cal/OSHA, for review and comment after an on-site consultation.

FIRE PROTECTION PLAN

Title 8, California Code of Regulations, section 3221 establishes the requirements for an Operation Fire Prevention Plan. The AFC contains a draft proposed fire protection plan which is adequate for staff's analysis. The plan discusses the following topics:

- on-site Fire Protection Systems, including carbon dioxide extinguishing systems, preaction sprinkler systems, a dry pipe deluge system, hand-held fire extinguishers, and fire detection and alarm systems; and
- local Fire Protection Services.

Staff proposes that La Paloma submit a final Fire Protection Plan to the California Energy Commission Compliance Project Manager (CPM) and the KCFD for review and approval to satisfy proposed conditions of certification **SAFETY 1** and **2**.

PERSONAL PROTECTIVE EQUIPMENT PROGRAM

The purpose of the Personal Protective Equipment Program is to ensure that employers comply with applicable requirements for the provision and use of Personal Protective Equipment (PPE), and to provide employees with the information and training necessary to carry out the program. La Paloma has provided a satisfactory outline that meets minimum requirements of a proposed PPE program.

Under Title 8, California Code Regulations, sections 3380 - 3400, personal protective equipment will be required whenever hazards are encountered which, due to process, environment, chemicals, or mechanical irritants, can cause injury or impairment of body function as a result of absorption, inhalation, or physical contact. The project's operational environment will create potential situations where personal protective equipment is required.

La Paloma's PPE Program should include a written policy on the use of protective equipment (and methods of communicating the policy to the employees); selection of the proper type of equipment; training of employees on the correct use and maintenance of the equipment; enforcement of personal protective equipment use; and the use of devices that provide respiratory protection, hearing conservation, eye protection and head protection.

Staff believes that if La Paloma develops and carries out a PPE Program similar to the format and elements listed above, the program will meet applicable regulations and will significantly reduce the potential for adverse impacts to workers.

GENERAL SAFETY

Besides the specific plans listed above, there are other requirements, some of which are called "safe work practices," imposed by various worker safety LORS applicable to this project. For the sake of clarity, staff has grouped these requirements as follows:

LIGHTING

American National Standards Practice for Industrial Lighting; ANSI/IES-RP-7 contains requirements to protect workers from inadequate lighting. Insufficient light leads to errors and sometimes accidents. An error may result from not seeing a situation that is dangerous and being able to react quickly enough. The **Visual Resources** section of this Preliminary Staff Assessment provides further detail concerning off-site consequences and performance requirements for exterior lighting.

HAZARDOUS MATERIALS RELEASES

Staff's analysis considered system design and administrative procedures to reduce the likelihood of an accidental release of acutely hazardous materials that could affect workers. See the **Hazardous Materials Section** for more detail.

SMOKING

La Paloma shall not allow smoking in an area designated in the National Electrical Code (NEC) as Class I, Division 1 and 2. These locations are areas where ignitable concentrations of flammable gases or vapors exist or where volatile flammable liquids or flammable gases are handled, processed, or used. Signs restricting smoking in those areas of the project site will be posted to protect the facility and workers.

LOCK-OUT/TAG-OUT

Title 8, California Code of Regulations, sections 2320.4, 2320.5, 2320.6, 2530.43, 2530.86, 3314, and 6003 identify required lock-out and tag-out safety practices and programs which reduce employee exposure to moving equipment, electrical shock, and hazardous and toxic materials. Lock-out is the placement of a padlock, blank flange, or similar device on equipment to ensure that it will not be operated until the lock-out device is removed. Tag-out is the use of warning signs that caution personnel that equipment cannot be energized until the lock-out device is removed. Warning signs can also be used to alert employees about the presence of hazardous and toxic materials. La Paloma's lock-out/tag-out program should include steps for applying locks and tags, steps for removing locks and tags, and employee training on lock-out/tag-out procedures.

CONFINED SPACES ENTRY PROGRAM

Title 8, California Code of Regulations, sections 5156 - 5159 identifies the minimal standards for preventing employee exposure to dangerous air contaminants and/or oxygen deficiency in confined spaces. A confined space is any space that limits the means of egress, is subject to toxic or flammable contaminants, or has an oxygen-deficient atmosphere. Examples of confined spaces are silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins and pits. La Paloma shall take the following steps to ensure worker safety during work in confined spaces.

Before entering a confined space, site personnel will evacuate or purge the space and will shut off lines that provide access for substances into the space. The air in the vessels will be tested for oxygen deficiency, and the presence of both toxic and explosive gases and vapors will be evaluated before entry into the confined space is allowed. Lifelines or safety harnesses will be worn by anyone entering the confined space, and a person will be stationed outside in a position to handle the line and to summon assistance in case of emergency. Appropriate respirators will be available whenever hazardous conditions may occur.

Hot work is any type of work that causes a spark and can ignite a fuel source. Examples include welding, cutting and brazing. Before proceeding with hot work, workers will need to get a work authorization from the project's assigned Safety Officer. The control operator, together with the shift supervisor, will decide whether hot work is required on a job and if a work authorization will be required. Before hot work is undertaken, the area will be inspected, the job shall be posted and, depending on what is located in the area, additional safeguards may be implemented.

FACILITY CLOSURE

The project owner and operator are responsible for maintaining an operational fire protection system during closure activities. The project must stay in compliance with all applicable health and safety LORS.

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

If La Paloma provides a Construction Safety and Health Plan, and an Operation Safety and Health Plan, as required in conditions of certification **SAFETY 1** and **2**; and provides the funding required by Conditions of Certification **SOCIO 2,** staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety and fire protection, and comply with applicable LORS.

RECOMMENDATIONS

If the Commission certifies the project, staff recommends that the Commission adopt the following proposed conditions of certification. The proposed conditions of certification provide assurance that the Project Construction and Operation Safety and Health Programs proposed by La Paloma will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

PROPOSED CONDITIONS OF CERTIFICATION

SAFETY-1 The project owner shall submit to the CPM a Project Construction Safety and Health Program, which shall include:

- Construction Injury and Illness Prevention Program
- Construction Fire Protection and Prevention Plan
- Personal Protective Equipment Program

Protocol: The Construction Injury and Illness Prevention Program and the Personal Protective Equipment Program shall be submitted to the California

Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders.

The Construction Fire Protection and Prevention Plan shall be submitted to the KCFD for review and acceptance.

Verification: At least 30 days prior to the start of construction, or a date agreed to by the CPM, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program and the Personal Protective Equipment Program, incorporating Cal/OSHA's Consultation Service comments. The project owner shall provide a letter from the KCFD stating that they have reviewed and accept the Construction Fire Protection and Prevention Plan.

SAFETY 2 The project owner shall submit to the CPM a Project Operation Safety and Health Program containing the following:

- Operation Injury and Illness Prevention Plan
- Emergency Action Plan
- Operation Fire Protection Plan
- Personal Protective Equipment Program

Protocol: The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders.

The Operation Fire Protection Plan and the Emergency Action Plan shall be submitted to the KCFD for review and acceptance.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operation Safety & Health Program. It shall incorporate Cal/OSHA's Consultation Service comments, stating that they have reviewed and accepted the specified elements of the proposed Operation Safety and Health Plan.

The project owner shall notify the CPM that the Project Operation Safety and Health Program (Injury and Illness Prevention Plan, Fire Protection Plan, the Emergency Action Plan, and Personal Protective Equipment requirements), including all records and files on accidents and incidents, is present on-site and available for inspection.

SAFETY-3 The project owner shall design and install all exterior lighting to meet the requirements contained in the Visual Resources conditions of

certification and in accordance with the American National Standards Practice for Industrial Lighting, ANSI/IES-RP-7.

Verification: Within 60 days after construction is completed, the project owner shall submit a statement to the CPM that the illuminance contained in ANSI/IES RP-7 were used as a basis for the design and installation of the exterior lighting.

REFERENCES

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Dickson, Chuck, Assistant Fire Marshall Kern County Fire Department, Letter discussing fire stations for La Paloma and Sunrise Cogeneration Plants, January 29, 1999.

La Paloma Generating Project. 1998. Application for Certification La Paloma Cogeneration Project (98-AFC-2) prepared by La Paloma Generating Company. Submitted July 1998.

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TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam

INTRODUCTION

The electricity generated at the proposed La Paloma Generating Project (LPGP) power plant will be transmitted to the existing Pacific Gas and Electric (PG&E) power grid through a 13.6-mile, double circuit 230 kV line. The line will originate from the project switchyard and terminate at PG&E's Midway Substation near Buttonwillow. Operating such a line could create several health and safety hazards as described in the submittal by the applicant (LPGP 1998, pp 4-1 through 4-11). Such hazards could be reduced through compliance with laws, ordinances, regulations and standards (LORS) identified by the applicant as applicable to the proposed project.

The purpose of staff's analysis is to assess the proposed line design for appropriate incorporation of measures necessary for compliance with applicable LORS. If found satisfactory, staff will recommend that the line be approved as proposed; if not, staff will recommend design revisions for further mitigation of potential health and safety hazards. The assessment will evaluate the following issues.

SAFETY HAZARDS	NUISANCE IMPACTS
Aviation safety	Audible noise
Fire hazards	Interference with radio-frequency communication
Electric and magnetic field exposure	Nuisance shocks

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Discussed below by subject area are design-related LORS applicable to the physical impacts of transmission lines as proposed for the power facility.

FEDERAL

AVIATION SAFETY

TITLE 14, CODE OF FEDERAL REGULATIONS, PART 77, "OBJECTS AFFECTING THE NAVIGATION SPACE"

Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a "Notice of Proposed Construction or Alteration" is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved.

FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR NO. 70/460-2H, "PROPOSED CONSTRUCTION AND OR ALTERATION OF OBJECTS THAT MAY AFFECT THE NAVIGATION SPACE"

This circular informs each proponent of a project that could pose an aviation hazard of the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA.

FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR NO. 70/460-1G, "OBSTRUCTION MARKING AND LIGHTING"

Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Code of Federal Regulations, part 77.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

FEDERAL COMMUNICATIONS COMMISSION (FCC) REGULATIONS IN TITLE 47, CODE OF FEDERAL REGULATIONS, SECTION 15.25

Provisions of these regulations prohibit operation of any devices producing force fields which interfere with radio communications even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When this noise is generated, it usually manifests as interference with radio or television signal reception. Since the level of interference will depend on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, no maximum interference level is specified as a design criterion for modern transmission lines.

STATE

CALIFORNIA PUBLIC UTILITIES COMMISSION, GENERAL ORDER 52 (CPUC, GO-52)

Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. The applicant intends to design the line in keeping with these requirements.

AUDIBLE NOISE

As with radio noise, any audible noise from a transmission line will usually result from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum. Such noise is usually generated during wet weather and from lines of 345 kV or higher. Research by the Electric Power Research Institute (EPRI 1982) has shown the fair-weather audible noise from modern transmission lines to be generally indistinguishable from ambient noise at the edge of a 100-ft right-of-way. There are

no design-specific regulations to limit the noise from transmission lines. Such sources is limited instead through design standards established from industry research and experience as effective for noise reduction without significant impacts on line safety, efficiency and reliability.

FIRE HAZARDS

The fires addressed through these regulations are those that could be caused by sparks from conductors of overhead lines or that could result from direct contact between the line and nearby trees.

CALIFORNIA PUBLIC UTILITIES COMMISSION, GENERAL ORDER 95, "RULES FOR OVERHEAD ELECTRIC LINE CONSTRUCTION" (CPUC, GO-95)

Tree trimming criteria to minimize the potential for power line-related fires.

TITLE 14, CALIFORNIA CODE OF REGULATIONS, SECTION 1250, "FIRE PREVENTION STANDARDS FOR ELECTRIC UTILITIES"

Utility-related measures for fire prevention.

HAZARDOUS SHOCKS

CALIFORNIA PUBLIC UTILITIES COMMISSION, GENERAL ORDER 95, "RULES FOR OVERHEAD LINE CONSTRUCTION" (CPUC, GO-95)

Uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements usually ensures the safety of the general public and line workers.

TITLE 8, CALIFORNIA CODE OF REGULATIONS, SECTION 2700 ET SEQ., "HIGH VOLTAGE ELECTRIC SAFETY ORDERS"

Establishes essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment; and the guarding against accidental contact with high-voltage lines.

NATIONAL ELECTRICAL SAFETY CODE, PART 2: "SAFETY RULES FOR OVERHEAD LINES"

Provisions in this part of the code specify the national safe operating clearances applicable in areas where the line might be accessible to the public. Such requirements are intended to minimize the potential for direct or indirect contact with the energized line.

The hazardous shocks that are addressed by these regulations and standards are those that could result from direct or indirect contact between the individual and the energized line. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

LOCAL

There are no local laws or regulations specifically aimed at the physical structure of electric power lines.

SETTING

As discussed in the **Project Description** section of the AFC, the route of the proposed line will parallel those of existing transmission lines and their rights-of-way for 12 miles, which will be approximately 95% of its 13.6-mile length. The main lines in this regard are the 230 kV Midway-Sunset line, and PG&E's Diablo-Midway #2 500 kV line. The individual segments of these lines were listed in the submittal by the applicant (LPGP 1998a, p 3.6-2). In the vicinity of the Midway substation (to which it will be connected) the line conductors will be located high enough for adequate clearance with the numerous transmission lines that converge at the substation. The proposed route will, at some point, pass within one mile of the communities of McKittrick and Buttonwillow and later cross over the California Aqueduct and State Highway 58. There are two residences within approximately 0.25 miles of the line along its route, pointing to minimal residential exposure to fields from the line. Since the line will be connected with the PG&E transmission system, it will be designed according to PG&E's line design criteria related to safety, efficiency, reliability, maintainability and appropriate field management.

Three types of support structure are proposed for the line and will be erected to provide a ground clearance of at least 30 ft at midspan. The applicant has identified these structures as most economic for the proposed line. These transmission structure configurations are shown in the **Project Description** section of the AFC. These structures will be located side-by-side with existing transmission structures in agricultural areas to minimize impacts on agricultural activities. A 100-ft right-of-way will be established adjacent to the existing route of the Midway-Sunset 230 kV line and PG&E's Diablo-Midway #2 500 kV line. Permission will also be obtained from PG&E, Southern California Gas Company (SoCal) and other utilities for the proposed line to cross existing rights-of-way.

IMPACTS

As noted in the LORS section, GO-95 and Title 8, California Code of Regulations, section 1250 provide the minimum regulatory requirements necessary to avoid line-related hazardous shocks to humans. Since the line-related audible noise and radio noise are produced in ways not allowing for specific regulatory design criteria, only the ground-level strengths of fields from transmission and other high-voltage lines can be used to evaluate the environmental acceptability of operation-related impacts in light of present knowledge about the physical and possible biological effects of such fields. These ground-level impacts may manifest as nuisance shocks or effects of field interactions with the biological system within the exposed individual.

NUISANCE SHOCKS

Nuisance shocks around transmission lines are non-hazardous but unpleasant experiences caused by current flow at levels generally incapable of significant physiological harm. Such shocks mostly result from direct contact with objects in which electric charges are induced by fields from the energized line. For modern high-voltage lines, shocks of this type are effectively minimized through grounding procedures specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). As with lines of the types proposed, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff has recommended specific conditions of certification (**TLSN- 5** and **TLSN-6**) to ensure such grounding within the right-of-way in all applicable cases.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

The possibility of health effects in individuals exposed to electric and magnetic fields has increased public fears in recent years about living near high-voltage lines. Since both fields occur together whenever electricity flows, exposure to them is generally considered together as EMF exposure. The available evidence has not established such fields as posing a significant public hazard to exposed humans. However, staff considers it important to realize that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore, considers it appropriate to at least maintain project-related fields within levels existing before the present concern about health. Further reductions could be made so long as they do not affect line safety, efficiency, reliability and maintainability.

What is clear from studies published so far is that any health hazard to an exposed individual would be small. It is also clear that the biologically significant types of exposure have not been established with regard to any possible risk, calling into question the biological usefulness of any attempt at exposure reduction. These and other facts have led staff to conclude that only modest measures are justified in any effort at field strength reduction.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component, whose effects could manifest as radio noise, audible noise and nuisance shocks, as previously noted. The present health-based focus, however, is on the magnetic field, which, unlike the companion electric field, can penetrate most objects, causing individuals to be exposed in buildings for long periods of time. It is the possible health consequences of such long-term exposure that are at the root of the present concern.

Given the focus on the relatively strong fields from high-voltage power lines, staff considers it important to note that the individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S. Department of Energy, 1995). Scientists have not established which types of

exposure would be more biologically meaningful in the individual. Such exposure differences are noted only to show that high-level magnetic field exposures regularly occur in areas other than the power line environment.

With no reliable showing of EMF health effects, most regulatory agencies believe, as staff does, that specific limits on electric or magnetic fields from power lines and other common sources are inappropriate. The few states (Florida, Minnesota, Montana, New Jersey, New York and Oregon) with such limits for power line electric fields established these limits as a guard against electric shocks from strong fields. The few states (Florida and New York) with limits for magnetic fields established these limits to keep exposures from new lines within levels associated with existing lines. None of these limits are based on established health effects nor are they intended for the retrofit of existing lines.

Given the limitations in the evidence suggesting a health hazard to exposed humans, most agencies who support additional field reductions believe that only low-cost or no-cost measures would be justified in any given case. The CPUC (which regulates the installation and operation of high-voltage lines in California) requires, at the present, that California utilities under its jurisdiction incorporate only low-cost or no-cost field reducing-measures in the design and siting of new transmission or other high-voltage lines in the state. Such limitations apply to the cost of redesign and relocation to reduce exposure. Utilities not within the jurisdiction of CPUC have agreed, through their representatives, to comply with these CPUC requirements. The necessary measures are specified in the design guidelines prepared by each utility for lines in its service area.

The strengths of the fields from each line design can be estimated using established procedures. Field strengths are specified in units of kilovolts per meter (kV/m) for the electric field and milligauss (mG) for the companion magnetic field. These estimates are computed for a height of one meter above the ground and depend on line voltage (in the case of electric fields) the geometry of the structures, degree of cancellation from nearby conductors, the distance between conductors and, in the case of magnetic fields, amount of current in the line.

With no health-based limits on the intensity of these and other power-system fields, the environmental acceptability of fields from a given power line will have to be assessed mainly in terms of (a) the successful application of field reduction measures specified in the guideline document applicable to the line in question, and (b) effective field reduction at costs falling within limits presently considered appropriate by the CPUC for such purposes. All related measures will have to be applied in ways that do not significantly impact line safety, efficiency, reliability and maintainability. The pre-project field strength estimates and post-project field measurements could be used, as necessary, to assess the effectiveness of the reduction measures involved or to compare the fields from the line in question with those of lines of similar voltage and current-carrying capacity.

As noted by the applicant, the proposed line will be connected to the existing PG&E power grid and will therefore be designed according to existing PG&E field management guidelines. Since these fields would reflect the level of success at

implementing the applicable field management guidelines, staff uses their reported and verified values to assess the environmental acceptability of the proposed power line project. These field strength values were calculated by the applicant in ways reflecting the interactive effects of these fields and fields from nearby existing lines

PROJECT SPECIFIC IMPACTS

AVIATION SAFETY

As noted in the AFC (LPGP 1998a, p 4-4), there are no major airports in the vicinity of the proposed facility. Bakersfield Airport is located more than 40 miles east of the proposed site and Taft Airport is located approximately 20 miles to the south. An FAA "Notice of Construction or Alteration" would not be required for the proposed power line according to existing regulatory criteria. The applicant, however, filed an advisory notice with the FAA on September 17, 1998, with regard to two project-related 100 ft tall stacks. If so advised by the FAA, the applicant will provide appropriate lighting in accordance with FAA requirements.

The project transmission line would be routed through a mostly agricultural area, where it could pose an obstruction hazard to pilots during agriculture-related operations along with the other existing power lines in the area (LPGP 1998, pp. 4-5 and 4-6). However, as further discussed by the applicant, the 3.5 miles involved would be relatively small when compared with the thousands of miles of transmission lines currently in the area. Furthermore, the line will be located at least 30 feet above the ground and will, therefore, minimize the obstruction hazard involved.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

Experience has shown the spark gap discharges from the proposed and similar transmission lines to be mostly responsible for radio interference in their vicinity. Such interference is generally avoided through appropriate design, which minimizes the occurrence of the structural gaps involved. The applicant intends to employ such a design (LPGP 1998a, p. 4-7). The provisions of the related FCC regulations are important in requiring each project owner to ensure mitigation of any such interference to the satisfaction of the effected individual. The applicant intends to investigate and mitigate any such complaints to the extent feasible (LPGP 1998a, p 4-7). Staff has proposed a condition of certification (**TLSN-2**) to ensure resolution of the communications interference problem on a case-specific basis.

AUDIBLE NOISE

According to the AFC (LPGP 1998, pp 4-6 and 4-7), the line will be designed to ensure a maximum conductor surface voltage gradient lower than normal for such lines. Such surface voltage is responsible for the line noise. The maximum fair-weather noise at the edge of the line right-of-way is predicted by the applicant as about 21.8 dBA. This, as noted by the applicant, is comparable to quiet conditions in the typical residence at night and much lower than the EPA guideline level of 55 dBA for the annual average day-night level outdoors. The applicant also notes the predicted 21.8 dBA level to be much below the Kern County allowable nighttime

noise level of 40 dBA for the “Highly Sensitive” land use category. Staff considers the noise from the proposed line to be similar to noise from modern transmission lines of the same voltage class and current-carrying capacity.

For an assessment of the noise from all phases of the proposed power plant and related facilities, please refer to staff’s analysis in the section under **Noise.**

HAZARDOUS SHOCKS

The applicant has stated their intention to comply with the minimum height and clearance requirements designed to prevent the direct or indirect human contact that could lead to the hazardous shocks of concern with regard to the proposed and similar lines (LPGP 1988, p 3.6-1, Appendix E). Staff does not expect the proposed line to pose any significant shock hazards to humans. A specific condition of certification (**TLSN-1**) has been proposed to ensure implementation of the mitigation measures involved.

FIRE HAZARDS

The proposed line will be routed through an agricultural area of minimal potential for fires from contact with nearby objects.

NUISANCE SHOCKS AND ELECTRIC AND MAGNETIC FIELDS

The applicant calculated the electric and magnetic field strengths at the left and right edges of the proposed line right-of-way and found them to be typical for the configurations proposed for the line. Field strength values were also calculated for existing lines, and the proposed line, to determine the net increase from line operation. These calculated values vary from 0.61 kV/m to 2.37 kV/m, depending on location of the line segment. These field intensities are similar to those from lines of similar voltage. Short-term nuisance shocks are possible within the right-of-way, but the potential for such shocks would be minimized, as is usual for such lines, by the grounding of fences, metal buildings and other objects within the right-of-way, and other related protective measures (LPGP 1998a, pp.4-9 and 4-10). Staff has recommended specific conditions of certification (TLSN-5 and TLSN-6) to avoid the nuisance shock hazards to property owners along the route of the proposed line.

The calculated magnetic field is projected to vary from 38.77 mG to 62.47 mG. These fields are similar in intensity to those from similar lines. Staff is in agreement with the applicant’s rationale for choosing the field reducing designs considered appropriate for lines in the PG&E service area.

CUMULATIVE IMPACTS

Fields from nearby conductors can interact to reduce their interactive effects below levels possible without the cancellation effects involved. The procedures currently used for field strength calculation allow a factoring of such cancellation effects as reflected in submittals by the applicant (PDEF 1988 p 3.6-11). This means that any cumulative effects of the proposed and nearby lines are, in an EMF exposure context, reflected in the field strength values predicted for the proposed line.

CONCLUSIONS

Staff concludes that the proposed transmission line will be designed to meet the safety-related specifications and regulations presently applicable to such lines. Field-reducing measures will be incorporated to the extent considered appropriate by staff for lines in the PG&E service area. Since health effects have neither been established nor ruled out for exposure to fields from such lines, the public health significance of any project-related exposure cannot be characterized with certainty. Staff notes, however, that the nearest residence would be about 0.25 miles from the line. At such a distance, the strength of fields from the line would diminish to background levels, indicating the lack of a line-related, long-term residential magnetic field exposure. It is such exposure that is at the root of the current concern over health effects.

Nuisance shock hazards would be minimized through the grounding and other measures to be implemented by the applicant. Staff, therefore recommends approval of the transmission line if it is designed and operated as proposed. If such approval is granted, staff recommends that the Commission adopt the following conditions of certification to ensure compliance with the LORS.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed transmission line according to the requirements of GO-95 and Title 8, California Code of Regulations, section 2700 et seq.

Verification: Thirty (30) days before start of transmission line construction, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the transmission line will be constructed according the requirements of GO-95 and Title 8, California Code of Regulations, section 2700 et seq.

TLSN-2 The project owner shall make every reasonable effort to identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of the line and related facilities. In addition to any transmission repairs, the relevant corrective actions should include, but shall not be limited to, adjusting or modifying receivers, adjusting or repairing, replacing or adding antennas, antenna signal amplifiers, filters, or lead-in cables.

The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to operation together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective

action taken. Complaints not leading to a specific action or for which there was no resolution should be noted and explained. The record shall be signed by the project owner and also the complainant, if possible, to indicate concurrence with the corrective action or agreement with the justification for a lack of action.

Verification: All reports of line-related complaints shall be summarized and included in the Annual Compliance Report to the CPM.

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields before beginning construction and after the line is energized. Measurements should be made at appropriate points along the route to allow verification of design assumptions relative to field strengths. The areas to be measured should include the facility switchyard and any residences near the right-of-way.

Verification: The project owner shall file a copy of the first set of pre-project measurements with the CPM at least 30 days before the start of construction. The post-project measurements shall be filed within 30 days after the day the line was energized.

TLSN-4 The project owner shall ensure that the transmission line right-of-way is kept free of combustible material as required under the provisions of Public Resources Code, section 4292 and California Code of Regulations, section 1250.

Verification: The project owner shall provide a summary of inspection results and any fire prevention activities along the right-of-way, in the annual compliance report.

TLSN-5 The project owner shall send a letter to all owners of property within or adjacent to the right-of-way at least 60 days prior to first transmission of electricity.

Protocol: The letter shall include the following:

- a discussion of the nature and operation of a transmission line;
- a discussion of the project owner's responsibility for grounding existing fences, gates, and other large permanent chargeable objects within the right-of-way regardless of ownership;
- a discussion of the property owner's responsibility to notify the project whenever the property owner adds or installs a metallic object which would require grounding as noted above; and
- a statement recommending against fueling motor vehicles or other mechanical equipment underneath the line.

Verification: The project owner shall submit the proposed letter to the CPM for review and approval 30 days prior to mailing to the property owners, and shall maintain a record of correspondence (notification and response) related to this requirement in a compliance file.

The project owner shall notify the CPM in the first Monthly Compliance Report that letters have been mailed and that copies are on file.

TLSN-6 The project owner shall ensure the grounding of any ungrounded permanent metallic objects within the right-of-way, regardless of ownership. Such objects shall include fences, gates, and other large objects. These objects shall be grounded according to procedures specified in the National Electrical Safety Code.

In the event of a refusal by the property owner to permit such grounding, the project owner shall so notify the CPM. Such notification shall include, when possible, the owner's written objection. Upon receipt of such notice, the CPM may waive the requirement for grounding the object involved.

Verification: At least 10 days before the line is energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

REFERENCES

Electric Power Research Institute (EPRI), 1982. Transmission Line Reference Book: 345 kV and Above.

Energy Commission Staff, 1992. High-Voltage Transmission Lines: Summary of Health Effects Studies. California Energy Commission Publication, P700-92-002.

LPGP (La Paloma Generating Company). 1998a. Application for Certification, La Paloma Generating Project (98-AFC-2). Submitted to the California Energy Commission, August 12.

HAZARDOUS MATERIALS MANAGEMENT

Testimony of Joseph M. Loyer

INTRODUCTION

The purpose of this analysis is to determine if the proposed La Paloma Generating Project (LPGP) will have a significant impact on the health and safety of the general public as a result of the handling or storage of hazardous materials at the facility. The scope of this analysis will include a determination of the project's ability to satisfy the applicable laws, ordinances, regulations and standards (LORS) after certification has been granted. This analysis goes beyond these reasonable assurances to comply with LORS in determining if there will likely be significant adverse impacts to the general public, pursuant to the Energy Commission responsibilities under the California Environmental Quality Act, 1993 (CEQA). If significant adverse impacts are identified, the Energy Commission staff will evaluate the potential for facility design alternatives or mitigation measures to reduce impacts to the extent feasible, as required pursuant to Title 20, California Code of Regulations, section 1742.5(a). The closely related issues of hazardous waste removal and worker safety are addressed in the areas of **Waste Management** and **Worker Safety and Fire Protection**. Also, the issue of transporting hazardous materials is handled in the **Traffic and Transportation** portion of this staff assessment.

APPLICABLE LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of hazardous or acutely hazardous substances. The Acts (implemented in 40 CFR § 68.115) require the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of these Acts, as well as additional requirements for handling and storage of acutely hazardous substances, are reflected in the California Health and Safety Code, section 25520 et seq.

STATE

HEALTH AND SAFETY CODE

CALIFORNIA HEALTH AND SAFETY CODE, SECTION 25500

This requires companies that handle hazardous materials in sufficient quantities to develop a Business Plan. The Business Plan must include:

- the basic information on the location, type, quantity, and the health risks of hazardous materials handled, used, stored, or disposed of in the state, which could be accidentally released into the environment;

- a plan for training new personnel and for annual training of all personnel in safety procedures to follow in the event of a release of hazardous materials; and

- an emergency response plan and the identity of the business representative able to assist emergency personnel in the event of a release.

CALIFORNIA HEALTH AND SAFETY CODE, SECTION 25531

This directs facilities handling hazardous materials in sufficient quantities to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities and the United States Environmental Protection Agency (EPA) for review and approval. The plan must identify:

- the severity of an accidental release;
- the likelihood of an accidental release occurring;
- the magnitude of potential human exposure;
- any pre-existing evaluations or studies of the material;
- the likelihood of the substance being handled in the manner indicated; and
- the accident history of the material.

This new program supersedes the California Risk Management and Prevention Plan (RMPP).

CODE OF REGULATIONS

Title 8, California Code of Regulations, Chapter 4, in part, describes the design requirements for the various storage tanks proposed by the applicant. These regulations are primarily designed to protect the on-site workers, but they protect the general public as well. While they are too voluminous to describe in detail here, the regulations generally require the applicant to design tanks to the American Society of Mechanical Engineers (ASME) coded standards.

CALIFORNIA BUILDING CODE

The California Building Code (CBC) contains requirements regarding the storage and handling of hazardous materials, in a Seismic Zone 4 area, which restrict the issuance of an occupancy permit until the applicant has demonstrated compliance with section 307.1.6 of the CBC. That section requires a Hazardous Materials Management Plan be completed, which is similar in some respects to the RMP. The proposed project site is in a Seismic Zone 4 area.

LOCAL AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. Article 80 was extensively revised in the latest edition. These articles contain

requirements that are generally similar to those contained in Health & Safety Code section 25531 et seq. The UFC does, however, contain unique requirements for secondary containment, monitoring, and treatment of toxic gases emitted through emergency venting. These unique requirements are generally restricted to extremely hazardous materials.

ENVIRONMENTAL SETTING

SITE AND VICINITY DESCRIPTION

The LPGP will be located in western Kern County about 40 miles from Bakersfield, California. The 23-acre site is located near the intersection of Skyline and Reserve Roads, approximately 1.5 miles east of McKittrick. Several factors associated with the location of the project affect its potential for causing public health impacts. These include:

- the local meteorology;
- terrain characteristics;
- special location considerations; and
- the location of population centers and sensitive receptors relative to the project.

Staff considered these factors in assessing the potential impacts to the public, which may occur in the event of an accidental release of hazardous material from the facility. The following sections describe the local conditions affecting public exposure in the area surrounding the proposed project.

METEOROLOGICAL CONDITIONS

Wind speed, wind direction and air temperature affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the level of public exposure to such materials and the associated health impacts. When wind speeds are low and stable, dispersion is minimized and can lead to significant health impacts to those exposed.

Recorded wind speeds and ambient air temperatures are discussed in the application (LPGP 1998a, AFC section 5.15-10). This data indicates that the predominant winds are from the southwest and have an E classification (slightly stable, from 4.6 to 6.9 mph), but can range up to D classification (neutral, 8.06 to 11.52 mph). Less frequent winds from the northwest occur under unstable situations. Local ambient air temperatures range from 15 to 115^{o}F, with an annual average of 65^{o}F.

TERRAIN CHARACTERISTICS

The location of elevated terrain (terrain above the stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. There is elevated terrain to the southwest within 10 miles of the

project site (see LPGP 1998a, AFC Figure 5.2-5). However, these elevated terrain areas are sparsely populated and are a significant distance from the project site, so they are not considered in the impacts modeling analysis.

SPECIAL LOCATION CONSIDERATIONS

The site is located in a CBC Seismic Zone 4 area, the zone of greatest potential shaking. The project will be designed to Seismic Zone 4 requirements or greater.

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general public includes many sensitive subgroups that may be at greater risk from exposure to hazardous materials. These sensitive subgroups include the very young, the elderly, and those with existing illnesses (Calabrese 1978). Also, the location of the general public in the area surrounding a project site may have a large bearing on exposure risk. Figure 5.15-8 (LPGP 1998a, AFC, page 5.15-19, 20) shows the locations of both the general public and sensitive subgroups in the project vicinity.

HAZARDOUS MATERIALS

The following hazardous materials, which are to be used at the facility, have a potential to impact the general public:

- sodium hypochlorite;
- sulfuric acid;
- aqueous ammonia; and
- natural gas.

The accidental release or mixing of the substances listed above can result in the release of a toxic or explosive gas. Sodium hypochlorite and sulfuric acid react and can produce chlorine gas. Sulfuric acid reacts with most metals to release hydrogen gas, which is explosive in air. The use of aqueous ammonia can result in the release of ammonia gas in the event of a spill, due to its relatively high vapor pressure. The use of natural gas can result in fires and/or explosions.

Other hazardous materials, such as scale inhibitors (phosphate), oxygen scavengers, neutralizing amine, biocides, settling aids, drainage aids, water softening and de-chlorinators, will be present at the proposed facility. However, these materials pose minimal potential for off-site impacts, as they will be stored in small quantities. A complete list of these materials is provided in Appendix B.

The typical methods used, in order of preference, to avoid or minimize impacts from the accidental releases of hazardous materials are as follows:

- use of non-hazardous or less hazardous materials;
- use of engineered controls;
- use of administrative controls; and
- emergency response planning.

IMPACTS

Staff has identified three major types of hazards associated with the proposed project:

- accidental release of ammonia gas;
- chlorine and hydrogen gas release; and
- fire and explosion from the use of natural gas.

As discussed below, the release of ammonia is, in staff's opinion, the most likely accident to occur at the facility with the potential for off-site impacts that should be modeled. It is staff's opinion that the release of hydrogen or chlorine gas, or explosion from natural gas, are extremely unlikely events and that modeling them would not provide additional useful information.

ACCIDENTAL RELEASE OF AMMONIA GAS

DELIVERY AND STORAGE OF AQUEOUS AMMONIA

The applicant has proposed the use of aqueous ammonia instead of the much more hazardous anhydrous ammonia. The use of aqueous ammonia results in a substantial risk reduction in that anhydrous ammonia is a gas at ambient conditions, while aqueous ammonia is not. However, the accidental release of aqueous ammonia can result in the emission of ammonia gas from the liquid upon loss of containment. This is the result of the relatively high vapor pressure of aqueous ammonia under ambient conditions which may exist at the time of release. Therefore, under certain conditions, an aqueous ammonia spill can cause significant impacts on public health and safety.

The applicant has submitted additional design specifications for the aqueous ammonia storage facility in an addendum to the AFC (LGPG 1998a, Addendum VI). The proposed aqueous ammonia storage facility will comply with CBC Seismic Zone 4 requirements, in addition to hazardous material storage requirements. The proposed facility will consist of a delivery truck bay and an ammonia storage building. The delivery truck bay will be open on three sides with a roof covering it. The floor will be sub graded and sloped towards the ammonia storage building. The tank storage building will include drains at the truck bay so that any ammonia or water spilled in the truck bay will drain into the ammonia storage building. An automated spill sensor and water sprinkler system will be incorporated into the roof of the truck bay to wash down any spills in the truck bay.

The tank storage building will have three or four 13,280-gallon, vertically mounted, aqueous ammonia storage tanks designed to Seismic Zone 4 specifications. The building will include a sub graded area that will have a capacity of 30,000 gallons (for three tanks) or 34,500 gallons (for four tanks) to provide overfill, truck bay spillage and tank rupture protection. The building will enclose the tanks on all four sides, as well as the necessary pumps for loading and handling the aqueous ammonia. The building will also include roof vents and air intake vents (located near ground level along the back wall), as well as a separate electrical control room.

An automated spill sensor system will trigger all vents in the building to close, effectively reducing the ammonia emissions during an accidental spill to zero. Figure 1-1 of the addendum from applicant shows the layout and dimensions of the four tank design option (LPGP 1998a, Addendum VI).

The applicant will develop an emergency response plan, in conjunction with the Kern County Fire Department, that will incorporate appropriate actions to take in the case of an aqueous ammonia spill of any kind (LPGP 1998a, AFC, page 5.15-23).

AQUEOUS AMMONIA RELEASE SCENARIOS

Several release scenarios were analyzed by the applicant to identify and mitigate to the extent feasible any significant risks to public health and safety. These scenarios are not intended to be inclusive of all possible accidents, but instead represent those accidents that are reasonably foreseeable. Each scenario is evaluated for its probability of occurrence and significance of impact. If a scenario is a probable event and will result in a significant impact, then those impacts will be mitigated to the extent feasible.

Aqueous Ammonia Transfer Release Scenario

Staff believes that the most likely scenario resulting in a significant impact to public health and safety would involve human errors during the process of transferring aqueous ammonia from the delivery truck to the storage tanks. These errors could result in the loss of all of the delivered material (approximately 8,000 gallons). However, in the event of a loss of this nature in the truck bay, the entire spill would drain by gravity into the tank storage building. Even assuming that the automated sprinkler system failed, the ammonia emissions while draining into the building would be so small that staff assumed it to be zero.

Aqueous Ammonia Storage Tank Release Scenario

The proposed tank storage building protects the aqueous ammonia storage tanks against environmental elements (rain, wind and sun) and vehicular traffic. The applicant is proposing to use three or four tanks (as opposed to one) to store the aqueous ammonia on site. That will provide a maximum design capacity of 53,120 gallons, while the sub-graded retention pit has a maximum design capacity of 34,500 gallons to handle the loss of only two tanks. Staff finds this acceptable given the remote probability of multiple tank ruptures. There is a small probability that the tanks could fail under inappropriate use (over drawing the tanks) or even normal use (design failure). Staff has not been able to determine an appropriate failure rate for tanks due to the lack of relevant information. However, the probability of three or four tanks failing at the same time would be the probability of one tank raised to the third or fourth power. For example, if the probability of failure of one tank is 1:1,000 (which is far too large a value) then the probability for three tanks to fail at the same time is 1:1,000,000,000. This is a *de minimus* level and can be disregarded.

The applicant used the following staff-recommended, short-term (30 minutes) exposure levels for modeling the off-site impacts of an accidental release of aqueous ammonia. They are: 1) lethality (2,000 parts per million (ppm)), 2) immediately dangerous to life and health (300 ppm), 3) the RMP endpoint required by EPA (200 ppm), and 4) a level considered to be without serious adverse effects on the public (75 ppm). An explanation of the exposure levels considered by staff and their applicability for use in modeling the accidental release of ammonia can be found in Appendix A. Staff also recommended that the nearest public receptor (a member of the general public) be assumed to be at the nearest residence, which is approximately 1.5 miles west of the facility site.

The applicant has modeled the accidental release of aqueous ammonia during delivery and from the catastrophic failure of at least one API storage tank as equivalent, using the following assumptions (LPGP 1998a, Addendum VI):

- the ambient air temperature is assumed to be 115oF;
- the wind stability is assumed to be F (stagnation);
- wind speeds are assumed to be between 1 and 1.5 meters per second;
- there is no plume rise, because there is no forced ventilation and the building air temperature is assumed to be equal to the ambient air temperature;
- the released amount is assumed to be 13,280 gallons, which represents the loss of one API tank; and
- the automated systems of the truck bay and ammonia storage building fail (no additional water from the sprinklers in the truck bay, and the vents on the building remain open).

The EPA-recommended emission rate equation relates the emission rate of ammonia to the ambient air temperature, ambient wind speed, molecular weight of ammonia, surface area of the pool and the vapor pressure of ammonia. In this equation (see below) the ambient wind speed and the surface area of the pool directly affect the emission rate. Reducing either term will reduce the emission rate of ammonia.

$$E = 6.94 \times 10^{-7} (1 + 0.0043(T_a - 273.15)^2) u_r^{0.78} A_p M (p_v/p_{vh})$$

Where: E = emission rate (kg/s)
ur = wind speed (m/s)
Ta = Ambient temperature (oK)
Ap = surface pool area (m2)
M = molecular weight (kg/kgmol)
Pv = vapor pressure of ammonia (Pa)
Pvh = vapor pressure of hydrazine at Ta (Pa)

This equation assumes that the pool in question is open to the ambient air. In the proposed aqueous ammonia storage facility, the pool is protected from the ambient air (i.e., the wind speed inside the building is effectively zero). However, the EPA guidance is to assume a mitigation factor of 10% on emission predictions using wind speed of 1.5 m/s for indoor pools. The applicant assumed a 12% mitigation factor for simplicity and added conservatism. Using these assumptions results in an indoor wind speed of 0.1 m/s.

The surface area of the pool is discounted due to the presence of the tanks. The total surface area of the basin is 154.77 m^2; the surface area of the tanks (four-4 m diameter tanks) is 50.27 m^2. The resulting effective surface area of the pool is 104.5 m^2.

The molecular weight of ammonia is 17 kg/kgmol, the vapor pressure of ammonia is 213,039 Pa and the vapor pressure of hydrazine is 6,204 Pa. These input values result in an emission rate of 69.8 g/s. Staff agrees with the applicant in characterizing this emission rate as conservative for the proposed ammonia storage facility.

Haz-Mat Table 1 shows the results of the SCREEN modeling analysis the applicant performed using the above emission factor. The applicant modeled several air temperatures, wind speeds and stability classes. The combination that produced the most significant results was 115 ^oF ambient air temperature, 1 m/s wind speed and F stability class (stagnation). According to figure 3.5-1 (LPGP 1998a, AFC page 3.5-6) the aqueous ammonia storage facility was to be located towards the southeastern corner of the facility. The closest property fence line is 13 meters away; the farthest is 198 meters. The nearest resident is located 2,496 meters towards McKittrick (west of the facility). Therefore, while the 300 ppm, 200 ppm and 75 ppm exposure levels are located off the property, they do not impact the nearest residence. Based on this analysis staff concludes that such an accidental release of aqueous ammonia will not cause a significant impact to public health and safety.

HAZ MAT TABLE 1
Results of Modeled Aqueous Ammonia Release

Recommended Exposure Levels for modeling off-site impacts of accidental ammonia spills	Distance (meters)	Specific Landmarks
2,000 ppm lethality →	-0- not detected beyond the aqueous ammonia storage facility	
	198	←Fence line, farthest from the aqueous ammonia storage facility
300 ppm IDLH →	241.2	
200 ppm RMP end point →	356.0	
75 ppm CEC Recommended →	822.6	
	2,496	← Nearest residence to the proposed power plant.

CHLORINE AND HYDROGEN GAS RELEASE

Sodium hypochlorite and sulfuric acid will be used to treat the cooling tower water for biological agents, water neutralization and pH level control. The mixture of sodium hypochlorite and sulfuric acid can result in the release of chlorine gas, which is extremely hazardous (CEC 1993). Sulfuric acid reacts with metals to form hydrogen gas, which is explosive in air.

Sodium hypochlorite will be used to treat water to control the growth of algae and other biological agents and to control pH. Staff supports the use of this material in that it poses much less risk than use of anhydrous chlorine, which is more commonly used for this purpose. Sulfuric acid will be used to control pH levels in the cooling tower and feed water.

Sodium hypochlorite will be stored in a 5,000-gallon plastic, above ground, vertically mounted storage tank, with a secondary containment wall surrounding it that is capable of holding the full contents of the tank plus 10%. The sulfuric acid will be stored in a 7,500-gallon lined and coated, steel, above ground, horizontally mounted tank, with a secondary containment wall surrounding it that is capable of holding the full contents of the tank plus 10%. The applicant has stated that these tanks will be separated by a significant distance, however, figure 3.5-1 (LPGP 1998a, AFC page 3.5-6) shows these tanks located next to each other. It is staff's opinion that 100 feet is a reasonable, safe and achievable separation distance. The applicant has agreed to incorporate this feature into the plant design.

Delivery of sodium hypochlorite and sulfuric acid will not occur at the same time. Both storage tanks will have separate loading hose connections, values, pumps and piping. Tag and lockout procedures will be implemented along with facility staff

oversight. Facility staff who will be overseeing the deliveries of these chemicals will receive training regarding their incompatibilities and the hazards of mixing them.

FIRE AND EXPLOSION FROM THE USE OF NATURAL GAS

Natural gas, which will be used as fuel for the facility, poses a fire and/or explosion risk as a result of its flammability. While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion will be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. National Fire Protection Association 85A requires; 1) the use of double block and bleed valves for gas shut-off, 2) automated combustion controls, and 3) burner management systems. These measures will significantly reduce the likelihood of an explosion in the heat recovery steam generators. Additionally, start-up procedures will require air purging of gas turbines and fireboxes prior to start-up to preclude the presence of an explosive mixture.

MITIGATION

ACCIDENTAL RELEASE OF AMMONIA GAS

Given the proposed delivery, storage and safety controls for aqueous ammonia, staff recommends no further mitigation.

CHLORINE AND HYDROGEN GAS RELEASE

Given the proposed delivery, storage and safety precautions for both sodium hypochlorite and sulfuric acid, staff recommends no further mitigation.

FIRE AND EXPLOSION FROM THE USE OF NATURAL GAS

Given the proposed controls for the use of natural gas, staff recommends no further mitigation.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicant will comply with all LORS requirements by developing a Business Plan, a Risk Management Plan and a Safety Management Plan (described below), as well as designing and constructing the proposed power plant to Seismic Zone 4 specifications.

The Business Plan (Health & Safety Code § 25500 et seq.) will include the basic information on the location, type, quantity, and the health risks of hazardous materials handled, used, stored, or disposed of in the state, which could be accidentally released into the environment. It must also include a plan for training new personnel and for annual training of all personnel in safety procedures to follow in the event of a release of hazardous materials. It must include an Emergency

Response Plan and identify the business representative able to assist emergency personnel in the event of a release.

The Risk Management Plan (Health & Safety Code § 25531 et seq.) will identify the severity of an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material.

The Safety Management Plan (Title 8, California Code of Regulations), which focuses on the delivery and handling of the identified hazardous materials, should identify management personnel (by job title) who are responsible for developing and implementing the identified safety procedures, and the safety procedures themselves. The plan will include how the applicant will motivate its employees to accomplish safety objectives, and detailed procedures used to address the hazards associated with human error during storage and transfer of hazardous materials.

CUMULATIVE IMPACTS

A cumulative impacts analysis is an analysis of a particular project viewed over time and in conjunction with other related past, present and reasonably foreseeable future projects whose impacts might compound or interrelate with those of the project at hand. To be adequate, the cumulative impacts analysis must include the following elements:

1. Either:
   a) a list of past, present and reasonably foreseeable future projects, or
   b) a summary of projections contained in the adopted general plan or planning document that is designed to evaluate regional or area-wide conditions.
2. A summary of such individual projects' expected environmental impacts.
3. A reasonable analysis of all projects' cumulative impacts.

The discussion of cumulative impacts for the accidental release of hazardous materials centers around the increase in risk to the public health and safety. Each facility that handles hazardous materials increases the risk to the public health and safety by a small amount. Taken together, those increased risks could be significant.

The area in which the project is located is heavily industrialized. Significant amounts of hazardous materials are transported, stored and used in the area of the western Kern County oil fields. There are expected to be four additional power plant projects in western Kern County. They will all be required to store and use ammonia for purposes of control of nitrogen oxides. Two of the four power plant projects will be storing anhydrous ammonia (instead of aqueous ammonia). This means that they might have more severe off-site impacts than a project using aqueous ammonia. The other two projects have not submitted AFCs to the Energy

Commission at this time. There might be as many as four power plant projects in western Kern County that could have significant potential for off-site impacts, which could result in a significant cumulative impact.

However, the IMPACTS ANALYSIS section of this testimony demonstrates that there will be no potential for significant off-site impacts on the public health and safety from the hazardous materials handled at the LPGP facility. Therefore, there is no significant cumulative impact associated with the LPGP project.

FACILITY CLOSURE

The project will eventually be closed. A power plant is typically intended to serve for twenty, thirty or forty years. At the end of that lifespan, a planned closure typically occurs, under which the facility is decommissioned in an orderly manner. Natural disasters, such as an earthquake or severe storm, and economic emergencies, such as loss of a fuel supply contract or power sales contract, can cause an unexpected temporary shutdown of the project. If damage to the project is too great, or if the economic problems cannot be solved, the unexpected shutdown may become permanent.

In each of these shutdown scenarios, it is imperative that hazardous materials stored onsite be managed safely. In the Facility Closure portion of the **General Conditions** section of this document, requirements are delineated that will require the project owner to submit to the CPM a Facility Closure Plan in the event of a planned closure of the facility. In addition, the General Conditions section requires the project owner to submit to the CPM, before commercial operation commences, On-site Contingency Plans that address how the hazardous materials will be managed in the event of an unexpected temporary or permanent closure. In order to ensure that hazardous materials are managed safely, the following provisions should be included in the Facility Closure Plan and the On-site Contingency Plan:

- In the case of a planned closure or an unexpected permanent closure, any hazardous materials present shall be removed from the site in accordance with all applicable LORS. One way of accomplishing this may be for the project owner to include, in its contracts with hazardous materials suppliers, a requirement that the supplier remove the materials if requested to do so by the project owner or any competent authority.

- In the case of an unexpected temporary closure, the On-site Contingency Plan shall address how the site and the hazardous materials will be managed safely for the period of closure. Should the temporary closure be declared permanent by the CPM, any hazardous materials present shall be removed from the site in accordance with all applicable LORS.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. To ensure that these measures are included in the Facility Closure Plan and the On-site Contingency Plan, a Condition of Certification (HAZ-5) is proposed, below.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the proposed handling of hazardous materials at the project site will comply with applicable LORS and will not result in a significant risk to public health. Staff proposes the following conditions of certification to ensure that the applicant performs all mitigation measures as proposed in the AFC.

The design and operation of the proposed project with adoption of staff's proposed conditions of certification will comply with all applicable LORS. The applicant will be required to submit a Business Plan and a Risk Management Plan to the Kern County Fire Department (KCFD). The KCFD will evaluate the proposed hazardous materials storage and handling systems and the risk assessment provided by the applicant and indicate whether they are satisfied with the proposed facilities.

RECOMMENDATIONS

Energy Commission staff recommends that the proposed conditions of certification presented herein be adopted by the Energy Commission to ensure that the project is designed, constructed and operated to protect public health and safety and to comply with applicable LORS. To insure adequacy of the Business Plan and Risk Management Plan, Energy Commission staff recommends that these plans be submitted to the Energy Commission Compliance Project Manager (CPM) for review, and to the KCFD for review and approval, prior to the delivery of any hazardous materials to the facility.

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous material in reportable quantities that is not listed in Appendix B, unless approved by the CPM.

Verification: The project owner shall provide in the Annual Compliance Report a list of hazardous materials used at the facility in reportable quantities.

HAZ-2 The project owner shall submit both the Business Plan and Risk Management Plan to the CPM for review and comment, and shall also submit these plans and/or procedures to the Kern County Fire Department for approval.

Verification: At least sixty (60) days prior to the initial delivery of any hazardous materials in reportable quantities to the facility, the project owner shall submit the Business Plan and Risk Management Plan to the CPM for review and comment. At the same time, the project owner shall submit these plans to the Kern County Fire Department for approval. The project owner shall also submit evidence to the CPM of the Kern County Fire Department approvals of these plans when available.

HAZ-3 The project owner shall provide a detailed Safety Management Plan (SMP) to the CPM for approval and review.

Protocol: The Safety Management Plan shall include the following: 1) a description of how each element of the SMP applies to the proposed facility; 2) an explicit chain of command (by job title on final organization chart) for each specific objective identified in the plan (for example, under "Accountability," list who will be responsible for the preparation of the specific statement of expectations, objectives and goals by senior management, daily shift logs and reports of abnormal conditions); 3) a description of how corporate management will ensure proper implementation of the SMP and ensure that production and safety are properly balanced; 4) methods that will be used to motivate employees to accomplish safety objectives; and 5) detailed procedures to address the hazards associated with human error during storage and transfer of hazardous materials.

Verification: At least sixty (60) days prior to the initial delivery of any hazardous materials in reportable quantities to the facility, the project owner shall provide a detailed Safety Management Plan as described in the Protocol section of this Condition of Certification to the CPM for review and approval.

HAZ-4 The project owner shall design and build the aqueous ammonia storage facility as described in Appendix C:

Verification: At least sixty (60) days prior to the delivery of aqueous ammonia, the project owner shall provide detailed designs for the aqueous ammonia storage facility to the CPM for review and comment.

HAZ-5 Prior to commencement of commercial operation, the project owner shall submit to the CPM for review and approval hazardous materials management plans as described below. These plans may be incorporated into the Facility Closure Plan and the On-site Contingency Plans (which are required under General Conditions).

Protocol: For the event of a planned closure or an unexpected permanent closure of the facility, the On-site Contingency Plan (and the Facility Closure Plan, should one be submitted) shall address how all hazardous materials will be removed from the site in accordance with all applicable LORS.

Protocol: For the event of an unexpected temporary closure of the facility, the On-site Contingency Plan shall address how the site and the hazardous materials will be secured and maintained safely for the period of closure. For the event in which the temporary closure is declared permanent by the CPM, the On-site Contingency Plan shall address how all hazardous materials will be removed from the site in accordance with all applicable LORS.

Verification: At least 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation, the project owner shall submit the above plans to the CPM for review and approval.

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APPENDIX A

BASIS FOR USE OF 75 PPM AMMONIA EXPOSURE CRITERIA

Staff uses a criterion of 75 ppm to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this criterion is not consistent with the 200 ppm criterion used by EPA and Cal EPA in evaluating such releases pursuant the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's CEQA analysis. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices are implemented and actions are taken in response to accidental releases. However, the regulations implementing these programs do not provide clear design changes or other major changes to a proposed facility.

The preface to the Emergency Response Planning Guidelines (ERPGs) states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to adult healthy individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations) they are not appropriate and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. CEQA requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through changes to the proposed project.

Staff has chosen to use the National Research Council's 30 minute Short Term Public Emergency Limits (STPELs) to determine the potential for significant impact. These limits are designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at these levels should not result in "serious sequelae" but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures of the general public to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events, and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that staff considered in arriving at the decision to use the 75-ppm STPEL.

ACUTE AMMONIA EXPOSURE GUIDELINES

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH[2]	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 min.	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible injury or impairment of the ability to escape.
IDLH/10[1]	EPA, NIOSH	Work place standard adjusted for general population factor of 10 for variation in sensitivity	30 ppm	30 min.	Protects nearly all segments of general population from irreversible effects
STEL[2]	NIOSH	Adult healthy male workers	35 ppm	15 min. 4 times per 8 hr day	No toxicity, including avoidance of irritation
EEGL[3]	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 min.	Significant irritation but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one time exposure
STPEL[4]	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 min. 30 min. 10 min.	Significant irritation but protect nearly all segments of general population from irreversible acute or latent effects. One time accidental exposure
TWA[2]	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. work shifts
ERPG-2[5]	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1. (EPA 1987) 2.(NIOSH 1994) 3.(NRC 1985) 4. (NRC 1972) 5. (AIHA 1989)

* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.

** The (NRC 1979) describes a study involving young animals which suggests greater sensitivity to acute exposure in young animals. The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

APPENDIX A - REFERENCES

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APPENDIX A - ABBREVIATIONS

ACGIH	American Conference of Governmental and Industrial Hygienists
AIHA	American Industrial Hygienists Association
EEGL	Emergency Exposure Guidance Level
EPA	Environmental Protection Agency
ERPG	Emergency Response Planning Guidelines
IDLH	Immediately Dangerous to Life and Health Level
NIOSH	National Institute of Occupational Health and Safety
NRC	National Research Council
STEL	Short Term Exposure Limit
STPEL	Short Term Public Emergency Limit
TLV	Threshold Limit Value
WHO	World Health Organization

APPENDIX B

HAZARDOUS MATERIALS TO BE USED AND STORED ON-SITE AT THE LA PALOMA GENERATING PROJECT

Chemical	Purpose	Storage Type	Storage Quantity	
			Usage/ Day	Maximum Amount Stored
Sulfuric acid (93%)	Circulating water treatment	Tank, lined C.S.	3,900 lbs	7,500 gal
Neutralizing amine solution	Feedwater pH control	Portable vessel	10 lbs	800 gal
Oxygen scavenger solution	Feedwater oxygen control	Portable vessel	5 lbs	800 gal
Di-, tri-sodium phospate solution	Boiler water pH/scale control	Portable vessel	10 lbs	800 gal
Aqueous ammonia (~30%)	NOx emission control	Tank, C.S.	3,000 gal	53,120 gal
Sodium hypochlorite (12%)	Biocide for condenser cooling water system, water treatment	Tank, plastic	1,200 lb	5,000 gal
Hydrochloric acid	Chemical cleaning of HRSG	Portable vessel	As needed	Temporary only
Ammonium bifluoride	Chemical cleaning of HRSG	Portable vessel	As needed	Temporary only
Citric acid	Chemical cleaning of HRSG, feedwater systems	Portable vessel	As needed	Temporary only
EDTA Chelant	Chemical cleaning of HRSG, feedwater systems	Portable vessel	As needed	Temporary only
Sodium nitrate	Chemical cleaning of HRSG	Portable vessel	As needed	Temporary only
Scale inhibitors	Control scale in circulating water system	Portable vessel	65 gal	2,000 gal
Polymer	Water treatment coagulant aid	Portable vessel	70 lbs	800 gal
Alum, aluminum sulfate, liquid (45%)	Water treatment coagulant	Tank, plastic	500 gal	10,000 gal
Diesel fuel oil	Diesel fire pump	Tank, UL C.S.	0	100 gal
Sulfuric acid for station batteries	Electrical/control building Combustion turbine Misc.	Battery	0	1,200 gal 1,464 gal 200 gal
Hydrogen	Generator Cooling	Tank, C.S	1,600 cf	120,000 cf

Source: LPGP 1998a, AFC Tables 3.4-6

APPENDIX C

FACILITY DESIGN*

A combined delivery and storage facility will be constructed. The proposed facility consists of an adjoining truck delivery bay and enclosed aqueous ammonia storage building. The truck delivery bay will be open on three sides, and will have a roof that will limit rain (or solar radiation) on the bay floor. This sub-grade delivery bay floor will be sloped to contain and drain any accidental ammonia spill during delivery and offloading. A water sprinkler system above the bay will dilute and wash any spills. Spills will flow quickly through drain slots into a large sub-grade containment area in the ammonia storage building, which will have enough capacity to hold the entire contents of an 8,000-gallon truck tank, plus spray water.

La Paloma Generating Company, LLC, is considering two facility layout options. Both options utilize the same design and safety concepts and have nearly identical layouts; the key differences being the number of ammonia storage tanks and the length of the building and delivery pad. The two options for the enclosed ammonia storage building are:

- Four 13,280-gallon storage tanks with a sub-grade spill basin capacity of approximately 34,500 gallons (excluding the volume occupied by the four tanks). This is enough capacity to hold all plausible tank overfill, tank rupture and delivery truck spill scenarios. The four-tank option has a larger (longer) building and truck pad than the following three-tank option, and is therefore used as a worst-case scenario from the standpoint of ammonia vapor emissions for the off-site consequence analysis provided in this submittal.

- Three 13,280-gallon storage tanks. In this case, the storage building's basin will have an approximate capacity of 30,000 gallons (excluding the volume occupied by the three tanks), which would also be enough capacity to hold all plausible spill scenarios.

HAZARDOUS MATERIALS HANDLING Figure 1 shows the layout and dimensions of the four-tank option. The layout for a three-tank option would be essentially the same, with a shorter storage building and truck bay.

* Adapted from La Paloma Generating Company, LLC, data request response of February 10, 1999.

HAZARDOUS MATERIAL HANDLING Figure 1

WASTE MANAGEMENT

Testimony of Ellen Townsend-Smith

INTRODUCTION

This section presents staff's evaluation of potential impacts from the storage and disposal of non-hazardous and hazardous waste material from the construction and operation of La Paloma Generating Company's (La Paloma) proposed La Paloma Generating Project (LPGP). The analysis focuses on whether the applicant's proposed waste management plans adequately reduce the risks and environmental impacts from the handling, storing, and disposing of project-related hazardous and non-hazardous wastes associated with construction and operation of the proposed project. This analysis does not include a discussion of wastewater which is discussed in the **Soil and Water Resources** section of this document.

Energy commission staff's primary concerns in this waste management analysis are to ensure that::

- Wastes generated during constructing and operating the proposed project will be managed in an environmentally safe manner;

- Disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities; and

- The management of the wastes will be in compliance with all applicable laws, ordinances, regulations and standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

- The Resource Conservation and Recovery Act (RCRA) sets forth standards for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal (42 USC § 6901 et seq.). The U. S. Environmental Protection Agency (EPA) may administer the provisions of RCRA in each state. However, the law also allows EPA to delegate the administration of the RCRA program to the various states when a state program is shown to meet federal requirements. When a state receives final EPA authorization of its program, its regulations have the force and effect of federal law. California received final authorization of its program on August 1, 1992.

- Under the provisions of the RCRA, the EPA has promulgated regulations identifying hazardous wastes subject to the management standards, either by listing them or by describing characteristics that qualify the wastes as hazardous. In addition, generators of hazardous waste must comply with requirements regarding:

- record keeping practices that identify quantities of hazardous wastes generated and their disposition;

- labeling practices and use of appropriate containers;

- use of a manifest system for transportation; and

- submissions of periodic reports to the EPA or authorized state agency.

The RCRA also establishes requirements applicable to hazardous waste transporters, including record keeping, compliance with the manifest system, obtaining EPA identification numbers and transporting only to permitted facilities.

Amendments to RCRA passed in 1984 broadened regulatory control and banned land disposal of untreated hazardous wastes.

Title 40, Code of Federal Regulations, section 260 et seq., contains regulations promulgated by the EPA to carry out the requirements of the RCRA as described above. These regulations describe characteristics of hazardous waste in terms of ignitability, corrosivity, reactivity and toxicity. They also list specific types of wastes.

STATE

The following laws and regulations apply, at least in part, to the proposed LPGP project:

- California Health and Safety Code section 25100 et seq. (Hazardous Waste Control Act of 1972, as amended.), creates the framework under which hazardous wastes are managed in California. It mandates the Department of Toxic Substances Control (DTSC) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with the California EPA (Cal EPA) and creates a manifest system to be used when transporting such wastes. Additionally, transporters of hazardous wastes must hold valid registrations with the Cal EPA DTSC Transportation unit.

- Title 22, California Code of Regulations, section 66001 et seq., adopted by DTSC, sets forth the State's minimum standards for the management of hazardous and extremely hazardous wastes. Title 22, California Code of Regulations, section 66262.10 et seq., establishes requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the Federal program, hazardous waste generators must obtain Cal EPA identification numbers, prepare manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, registered hazardous waste transporters handle hazardous wastewater. Generator requirements for record keeping, reporting, packaging and labeling are also established.

LOCAL

Pursuant to Senate Bill 1082 (Stats. 1993, ch. 418) the Secretary for Environmental Protection established requirements under which every county must apply to the Secretary for approval of a unified hazardous waste and hazardous materials management regulatory program. (Health and Safety Code §§ 25404 and 25404.6)

The Kern County Environmental Health Department is the Certified Unified Program Agency (CUPA) that consolidates, coordinates and makes consistent the administrative requirements, permits, inspection activities, enforcement activities, and hazardous waste and hazardous materials fees (Von Sydow 1999). The applicant will obtain a hazardous waste generator permit from the Kern County Environmental Health Department. Refer to **WASTE-2**.

SETTING

SITE AND VICINITY DESCRIPTION

The applicant has proposed to build a 1,048 megawatt combined cycle electric generating project in Kern County, California. The project also includes a new 13.6 mile 230 kV transmission line, a new 370-foot gas pipeline, a new 24 inch raw water pipeline, a 700,000 gallon raw water storage tank, and a potable water 1.5 mile, 6-inch diameter pipeline (LPGP 1998a, AFC page 1-7 and 1-8).

USR Greiner Woodward-Clyde, environmental consultant to La Paloma, conducted a Phase I Environmental Site Assessment (ESA) for the 23-acre LPGP site. The project site is located in an oil exploration area. The ESA identified a minor amount of oil exploration apparatus on the project site, such as abandoned oil wells, piping, sumps, pits and ponds. The site reconnaissance portion of the ESA identified soil staining, but did not identify any other hazardous materials or hazardous waste disposal activity. (LPGP 1998b, ESA page 6-1 and7-1).

IMPACTS

CONSTRUCTION

Constructing the proposed project will generate various non-hazardous and hazardous wastes under normal conditions. WASTE MANAGEMENT Table 1 describes the waste streams, classification, amounts and management methods to be used by LPGP in constructing the proposed project.

WASTE MANAGEMENT Table 1
Summary of Construction Waste Streams and Management Methods

Waste Stream	Classification	Amount	Off-site Treatment
Scrap wood, steel, glass, plastic, paper, calcium silicate insulation, mineral wool insulation	Non-hazardous	40 yd^3/ wk	Landfill
Empty Hazardous material containers	Hazardous	1 yd^3/wk	Hazardous waste disposal facility
Solvents, used construction equipment lube oils, paint, adhesives	Hazardous	55 gals./mo.	Hazardous waste disposal facility or recycle
Used and waste lube oil during CT and ST lube oil flushes	Hazardous	55 gals./flush each period, (approx. 3 weeks)	Hazardous waste disposal facility
Oily rags, oil absorbent from CT and ST Lube oil flushes	Hazardous	55 gals./flush each period, (approx. 3 weeks)	Hazardous waste disposal facility
Oil rags, oil absorbent generated during normal construction activities excluding lube oil flushes	Hazardous	55 gals./mo.	Hazardous waste disposal facility
Spent batteries, lead acid	Hazardous	2 batteries/ yr.	Recycle
Spent batteries; alkaline type, sizes AAA,AA, C and D	Hazardous	60 batteries/mo.	Hazardous waste disposal facility
HRSG and Preboiler Piping cleaning waste, chelant type solution	Hazardous	200,000 gals./ cleaning	Hazardous waste disposal facility or recycle
Waste oil from oil/ waster separator	Hazardous	20 gallons/ mo.	Hazardous waste disposal facility
Sanitary Waste-Portable chemical Toilets and Construction Office Holding Tanks	Sanitary	400 gals./ day	Ship to sanitary water treatment plant
Storm water from construction area	Non-hazardous	334,000 gals. for a once-in-a-2-year, 24 hour storm event	Discharge to the storm water detention basin

Source: La Paloma 1998b, Data Response 22.

OPERATION

During operation of the proposed project, hazardous and non-hazardous wastes will be generated. WASTE MANAGEMENT Table 2 describes the waste streams,classification, amounts and management methods to be used by LPGP during operation.

Chemical feed area drains consisting of spillage, tank overflows, maintenance operations and area washdowns will be routed to a neutralization facility for pH adjustment along with demineralizer regeneration wastes. Such elementary neutralization is considered to be hazardous waste treatment under California regulations (Cal. Code Regs., tit. 22, sec. 67450.1 et seq.) and requires a permit from the Department of Toxic Substances Control.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

When recycling is not a practical alternative, the applicant will use landfills for solid waste disposal. The applicant has identified the Taft, Bakersfield (Bena), Arvin, Safter-Wasco and the Lost Hills Sanitary Landfills as disposal sites for Class III non-hazardous disposal (La Paloma 1998). The County of Kern Waste Management Department operates all of the landfills. All of the landfills have adequate capacity for the LPGP to be constructed and operated in Kern County (Kidwell 1999). The Lost Hills landfill may be scheduled for closure in 2000 and reopened in 2021. (Kidwell 1999).

Hazardous wastes are required to be disposed of in Class I landfills. There are three major Class I landfills in California, Laidlaw Environmental in Kern County, Chemical Waste Management in Kings County and Laidlaw Environmental in Imperial County. Each of these hazardous waste landfills has enough capacity to receive the hazardous waste generated from the construction and operation of the proposed project.

- Chemical Waste Management's Kettleman Hills facility (Kings County). The facility has approximately eight million tons of remaining capacity, which is operational, and an additional four million tons of capacity, which has been, permitted but not yet constructed (Yarborough 1998). The expected remaining life is 48 years.

- Laidlaw Environmental Service's Lokern facility in Buttonwillow (Kern County). Remaining capacity is approximately 17 million tons, with a remaining lifetime of about 30 years (Nielson 1998).

- Laidlaw Environmental Service's facility in Westmoreland (Imperial County). The estimated remaining capacity is four million tons, with a remaining life expectancy of about 50 years (Yadvish 1998).

Much of the waste generated during facility construction and operation can be recycled, such as used oil and spent catalysts. Even without recycling, the generation of non-hazardous and hazardous waste from this type of facility would

WASTE MANAGEMENT Table 2
Summary of Operating Waste Streams and Management Methods

Waste Stream	Classification	Amount	Off-Site Treatment
Used hydraulic fluid, oils, grease, oily filters	Hazardous	<5 gals./day	Hazardous waste disposal facility/treatment
Spent batteries	Hazardous	2 batteries/yr.	Recycle
Spent SCR catalyst (heavy metals)	Hazardous	56 m^3/yr,	Recycle
SCONOx catalyst wash (potassium carbonate solution)	Non-hazardous	6,000 gals./wash	Waste disposal facility after neutralization or Recycle
Pretreatment system filter cake solids	Non-hazardous	6.7 tons/day	Waste disposal facility
Activated carbon and sand, filter media	Non-hazardous	10 ft^3/ year	Waste disposal facility
Cooling tower basin sludge	Hazardous	2 tons/yr.	Hazardous waste disposal facility
Waste oil from oil/water separator	Hazardous	100 gals./yr.	Hazardous waste disposal facility
Oily rags, oil absorbent	Hazardous	55 galls./mo.	Hazardous waste disposal facility
CTG used air filters	Non-hazardous	2,100 filters	Recycle
CTG wash water	Non-hazardous	2,000 gallons/year	Waste disposal facility
HRSG periodic operational chemical cleaning	Hazardous	50,000 gallons/HRSG cleaning	Hazardous waste disposal facility
Sanitary wastewater	Non-hazardous	3,000 gals./day	Septic tank and leach field

Source: La Paloma 1998, Data Response 22.

not significantly impact the capacity of any of the Class I or Class III landfills in California. Therefore, this project will have an inconsequential effect on either the daily capacity or remaining life of the Class I or Class III landfills.

CUMULATIVE IMPACTS

Due to the availability of multiple landfills with adequate capacity within the region, cumulative impacts from this and other projects will be insignificant for both hazardous and non-hazardous wastes.

FACILITY CLOSURE

Closure activities within the scope of waste management may include removal of all wastes remaining on the site. Wastes from closure activities should be managed, recycled, and disposed of according to all applicable waste-related LORS in affect at the time of closure. At this time, staff does not believe there are any major waste disposal issues related to closure of the facility, that need to be addressed at the time that the closure plan is developed.

MITIGATION

Staff agrees with La Paloma's proposed mitigation measures. The mitigation measures are consistent with waste management practices applied to previous projects. The applicant intends to implement the following mitigation measures during construction and operation of the proposed project (LPGP 1998A, AFC page 5.14-10 - 5.14-13):

- Construction contractors will receive hazardous materials training during subsurface excavation.

- Employees will be trained to identify contaminated soil and will be trained on proper handling and storage methods.

- The applicant will develop a detailed waste management plan to use during construction and operation of the project. The plan will include description of all waste streams and methods of managing each waste. Refer to Condition of Certification **WASTE-I**.

- The applicant will file an application through DTSC for an EPA identification number (Refer to Condition of Certification **WASTE-2**).

- All hazardous waste will be stored on site less than 90 days unless LORS dictate otherwise.

- Hazardous waste will be collected by a licensed hazardous waste hauler and disposed of at a hazardous waste facility. (Refer to Condition of Certification **WASTE-2)**.

- Spill control and management procedures will be included in the Hazardous Materials Business Plan.

- Employees will receive hazardous materials training.

COMPLIANCE WITH LORS

Energy Commission staff concludes that La Paloma will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during project construction and operation. Because hazardous wastes will be produced during project construction and operation, La Paloma must acquire and maintain an EPA identification number as a hazardous waste generator. Accordingly, La Paloma will be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, and to keep detailed records. La Paloma may also be required, pursuant to Title 22, California Code of Regulations, section 67100.1 et seq., to undertake a hazardous waste source reduction and management review, depending on the amounts of hazardous waste ultimately generated.

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the wastes generated during construction and operation of the proposed project will not result in any significant adverse impacts, if the applicant implements the mitigation measures proposed above, as required by the following proposed Conditions of Certification.

RECOMMENDATIONS

If the Commission certifies the project, staff recommends that the Commission adopt the following proposed Conditions of Certification. The proposed Conditions of Certification provide assurance that the project's hazardous and non-hazardous wastes will not cause any significant impacts, and that the proposed procedures for management of hazardous and non-hazardous wastes will be reviewed by the appropriate agencies before they are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 Prior to the start of construction, the project owner shall prepare and submit to the Compliance Project Manager (CPM) a finalized Waste Management Plan for all wastes generated during construction and operation of the project. The plan shall contain at least the following:

- A description of all waste streams, including their origin, estimates of amounts, frequency of generation, and hazardous or non-hazardous classification and reasons therefore.

- Methods of managing each waste, including treatment methods and treatment contractors, methods of testing wastes to assure correct classification, modes of transportation, disposal requirements and sites, and recycling and waste minimization plans.

Verification: At least 90 days prior to start of rough grading; the project owner shall submit a Waste Management Plan to the CPM for review and approval. Within 15 days of receipt of the plan, the CPM will indicate approval/disapproval, changes or additional information needed. In the Annual Compliance Report, the project owner shall summarize planned versus actual waste management activities.

NOTE: At the project owner's discretion, management plans for construction and operation wastes may be prepared separately. If so, the operational waste plan shall be submitted at least 60 days prior to the start of operation.

WASTE-2 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control. The project owner shall also obtain a hazardous waste generator permit from the Kern County Environmental Health Department, which is a Certified Unified Program Agency (CUPA).

Verification: At least 30 days prior to start of rough grading, the project owner shall submit to the CPM, copies of the hazardous waste generator identification number and of the Kern County Environmental Health Department hazardous waste generator permit.

WASTE-3 The project owner shall notify the CPM of any waste management-related enforcement action that has either been taken or is known to be pending against it or against any waste hauler or treatment, storage, or disposal facility with which it contracts.

Verification: The project owner shall notify the CPM in writing within 10 working days of becoming aware of any such enforcement action.

GLOSSARY OF TECHNICAL ACRONYMS USED

CT	Combustion Turbine
CTG	Combustion Turbine Generator
ST	Steam Turbine
HRSG	Heat Recovery Steam Generator
SCR	Selective Catalytic Reduction

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LAND USE

Testimony of Amanda Stennick

INTRODUCTION

This assessment of land use impacts for the La Paloma Generating Project (LPGP) focuses on two main issues: the conformity of the project with local land use plans, ordinances and policies; and the potential of the proposed project to have direct, indirect, and cumulative land use conflicts with existing and planned uses. In general, an electric generation project and its related facilities can be incompatible with existing or planned land uses when it creates unmitigated noise, odor, dust, public health hazard or nuisance, traffic, or visual impacts or when it significantly restricts existing or future uses.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

STATE

TITLE 8, CALIFORNIA CODE OF REGULATIONS, SECTION 2700 ET SEQ., "HIGH VOLTAGE ELECTRIC SAFETY ORDERS"

Establishes essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment; and the guarding against accidental contact with high-voltage lines.

KERN COUNTY GENERAL PLAN

The general plan is the legal document that acts as a constitution for land use and development in Kern County. It consists of the seven mandatory elements: land use, circulation, open space, conservation, housing, safety and seismic safety, and noise; and four optional elements: recreation, energy, hazardous waste management, and public services and facilities (Kern County 1996a). The following land use designations of the Kern County General Plan are specific to the proposed project.

LAND USE DESIGNATIONS

NONJURISDICTIONAL LAND

State and Federal Land - All property under the ownership and control of various state and federal agencies.

RESOURCE

Intensive Agriculture

Applies to areas devoted to the production of irrigated crops or having the potential for such use. Other agricultural uses may be consistent with the intensive

agriculture designation. Minimum parcel size is 20 acres gross. Permitted uses include, but are not limited to:

- Primary: irrigated cropland, orchards, vineyards, ranch and farm facilities, etc.; one single-family dwelling unit.

- Compatible: livestock grazing, water storage, mineral and petroleum exploration and extraction, and public utility uses, etc., pursuant to provisions of the Zoning Ordinance.

Extensive Agriculture

Applies to agricultural uses involving large amounts of land with relatively low value-per-acre yields. Minimum parcel size is 20 acres gross, except lands not under Williamson Act Contract, in which case the minimum parcel size shall be 80 acres gross. Permitted uses include, but are not limited to:

- Primary: livestock grazing, dry land farming, ranching facilities, wildlife and botanical preserves, timber harvesting, etc.; one single-family dwelling unit; and

- Compatible: irrigated croplands, water storage or ground water extraction, recharge areas, mineral and petroleum exploration, recreational activities, etc.

Mineral and Petroleum

Applies to areas, which contain producing, or potentially productive, petroleum fields and mineral deposits. Uses are limited to activities directly associated with resource extraction. Minimum parcel size is 5 acres gross. Permitted uses include, but are not limited to:

- Primary: mineral and petroleum exploration and extraction; and

- Compatible: extensive and intensive agriculture, mineral and petroleum processing, pipelines, power transmission facilities, communication facilities, equipment storage yards, and one single-family dwelling unit (subject to a Conditional Use Permit).

PHYSICAL CONSTRAINTS

Includes overlay zones denoting physical constraints. Those applicable include:

- Steep Slopes: Land with an average slope of 30 percent or steeper; and

- Flood Hazard: Based on the Flood Hazard Boundary Maps of the US Department of Housing and Urban Development and the Kern County Water Agency. These areas include, for example, flood channels and watercourses, riverbeds, and gullies. Development within these areas is subject to review by the County and will include conformity with adopted ordinances.

These are areas for which area-wide land use plans have been prepared or approved. They include both "Accepted County Plan Areas" and "Rural Community" plans:

- Accepted County Plan Areas: Specific land use areas for which plans have been prepared and approved.

- Rural Community: Settlements in the County that have individual character and are recognized as unique communities meriting Specific Plan level of detail.

GENERAL PLAN LAND USE DESIGNATIONS WITHIN THE STUDY AREA

Location or Linear Facility1[1]	Land Use Designation
La Paloma Generating Plant	Extensive Agricultural/Mineral and Petroleum
Route 1 (R1) Transmission Line Route	Extensive Agricultural/Mineral and Petroleum
Route 2 (R2) Water Supply Line Route	Extensive Agricultural/Mineral and Petroleum
Route 4 (R4) Potable Water Supply Line Route	Extensive Agricultural/Mineral and Petroleum
Route 5 (R5) Natural Gas Supply Line	Extensive Agricultural/Mineral and Petroleum

EXISTING LAND USES WITHIN THE STUDY AREA

Location or Linear Facility	Existing Land Uses
La Paloma Generating Plant	Undeveloped/Oil Wells
Route 1 (R1) Transmission Line Route	BLM lands and Undeveloped/Oil Wells/California Department of Fish and Game lands/California Aqueduct, Levee, Flood Canal/Agricultural, Buttonwillow Park
Route 2 (R2) Water Supply Line Route	BLM lands and Undeveloped/Oil Wells
Route 4 (R4) Potable Water Supply Line Route	BLM lands and Undeveloped/Oil Wells/Residential
Route 5 (R5) Natural Gas Supply Line	BLM lands and Undeveloped/Oil Wells

LAND USE PLANS AND POLICIES RELATED TO THE LA PALOMA GENERATING PROJECT

The following provisions of the Kern County General Plan, McKittrick Rural Community Plan, Buttonwillow Community Development Plan, U.S. Fish and Wildlife Service, and Caliente Resource Management Plan are specific to the proposed project. Please refer to the **Socioeconomic Resources and Noise** sections of the Final Staff Assessment (FSA) for a discussion of the applicable policies of the Kern County General Plan. Please refer to the **Biological Resources** section of the FSA for a discussion of the applicable policies of the U.S. Fish and Wildlife Service and the California Department of Fish and Game.

[1] Routes 1A and 3 were removed from consideration by La Paloma on March 5, 1999 (LPGP 1998a, Addendum VIII.

NONJURISDICTIONAL LAND

- Coordination and cooperation will be promoted among the County, the incorporated cities and the various special districts where their planning decisions and actions affect more than a single jurisdiction (Policy No. 1).

- Land under state and federal jurisdiction will be considered as land designated for “Resource Management” on the General Plan map (Policy No. 4).

PHYSICAL CONSTRAINTS

- Kern County will not permit new developments to be sited on land that is environmentally unsound to support such development (Policy No. 1).

- Development will not be allowed in natural hazard areas pending the adoption of ordinances that establish conditions, criteria and standards in order to minimize risk to life and property posed by those risks (Policy No. 2).

- Zoning and other land use controls will be used to regulate and, in some instances, to prohibit development in hazardous areas (Policy No. 3).

- New development will not be permitted in areas of landslide or slope instability as designated in the Safety and Seismic Safety Element of the General Plan, and as mapped on the Kern County Seismic Hazard Atlas (Policy No. 6).

- Regardless of percentage of slope, development on hillsides will be sited in the least obtrusive fashion, thereby minimizing the extent of topographic alteration required (Nonjurisdictional Land - Policy No. 1, p. 1 - Policy no. 9)

- Development proposed in areas with steep slopes will be reviewed for conformity to the adopted Hillside Development Ordinance to ensure that appropriate stability, drainage, and sewage treatment will result (Policy No. 10).

- Designated flood channels and watercourses, such as creeks, gullies, and riverbeds will be preserved as resource management areas or, in the case of the urban areas, as linear parks (Policy No. 12).

- New development will be required to demonstrate the availability of adequate fire protection and suppression facilities (Policy No. 13).

- Kern County will evaluate the potential noise impacts of any development-siting action or of any applications it acts upon that could significantly alter noise levels in the community and will require mitigative measures where significant adverse effects are identified (Policy No. 14).

- The air quality effects of a proposed land use will be considered when evaluating development proposals (Physical Constraints - Policy No. 15, p. 2-3).

- Kern County will disapprove projects found to have significant adverse effects on Kern County's air quality, unless the Board of Supervisors, Board of Zoning Adjustment, or the Director of Planning and Development Services, acting as Hearing Officer or Parcel Map Advisory Agency makes findings under CEQA (Policy No. 16).

Special Treatment Areas

- In areas designated "Specific Plan Required" with more than one owner, the interim designations will reflect the existing zoning pattern until the County prepares and adopts a Specific Plan (Policy 3(b)).

Resource

- Areas designated agricultural use, which include Class I and II agricultural soils with surface water delivery systems will be protected against residential and commercial subdivision and development activities (Policy No. 1).

- Areas identified by the Soil Conservation Service as having high range-site value will be reserved for extensive agricultural use or as resource reserves if located within a County water district (Policy No. 2).

- In areas with a Resource designation on the General Plan map, only industrial activities which directly and obviously relate to the exploration, production, and transportation of the particular resource will be considered to be consistent with this plan (Policy No. 4).

- Development will be constrained, pending adoption of ordinances, which establish conditions, criteria, and standards, in areas containing valuable resources in order to protect the access to and economic use of these resources (Policy No. 9).

- Rivers and streams in the County are important visual and recreational resources and wildlife habitats. Areas of riparian vegetation along rivers and streams will therefore be preserved when feasible to do so (Policy No. 11).

- The County will maintain and enhance air quality for the health and well being of County residents by encouraging land uses which promote air quality and good visibility (Policy No. 13).

- Habitats of threatened or endangered species should be protected to the greatest extent possible (Policy No. 14).

- Management which are presently under Williamson Act Contracts will have a minimum parcel size of 80 acres until such time as a contract expires or is canceled, at which time the minimum parcel size will become 20 acres (Policy No. 15).

GENERAL PROVISIONS

- Prior to issuance of any development or use permit, the County shall make the finding, based on information provided by California Environmental Quality Act (CEQA) documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development. The developer shall assume full responsibility for costs incurred in service extensions or improvements that are required as a result of the proposed project (Policy No. 3).

- The air quality implications of new development will be considered in approval of major developments or area wide land use designations (Policy No. 15).

- The County will promote the preservation of designated historic buildings and the protection of cultural resources which provide ties with the past and constitute a heritage value to residents and visitors (Policy No. 16).

- Maintain the County's inventory of areas of potential cultural and archaeological significance (Implementation G).

MCKITTRICK RURAL COMMUNITY PLAN

The McKittrick Rural Community Plan has been developed using the criteria, goals, policies, and implementing ordinances of the Kern County General Plan. Programs and document framework for the McKittrick Plan are the same as those used in the Kern County General Plan.

BUTTONWILLOW COMMUNITY DEVELOPMENT PLAN

Open Space

- Encourage continuing dual use of transmission line easements as open space or possibly greenbelt areas (Implementation P. 23).

- Continuance of land use contracts under the provisions of the Williamson Act and maintenance of the A (Exclusive Agricultural) zoning classification for agricultural lands (Implementation, P. 25).

- Encourage continuance of land use contracts under the provisions of the California Land Conservation Act of 1965, as amended, and commonly referred to as "The Williamson Act" (Implementation, P. 30).

FISH AND WILDLIFE

- Encourage programs to locate and determine populations of rare and endangered species (Implementation, P. 85).

Resource Policy and Management Guidance

- All lands in the resource area are available for cooperative management agreements with local governments and/or private organizations, provided that proposed management conforms to plan objectives and land use allocations (Policy No. 14).

- BLM shall not jeopardize the continued existence of any plant or animal that is listed as threatened or endangered by the federal or state government, or is either proposed for listing or is a candidate for listing by the federal government (Policy No. 19).

- Efforts to avoid adverse effects to cultural resources will be implemented (Policy No. 26).

- Proposals for future development activities will require additional NEPA analysis (Policy No. 27).

- Protection of paleontological resources will include the assessment of the threat to these resources, along with the implementation of measures designed to mitigate these impacts (Policy No. 27).

- The authorized office may approve the use of motor vehicles on any public lands in the resource area (Policy No. 40).

- Resource Guidance and Decisions

- Improve the management efficiency of federal lands, improve resources protection and provide lands for public and private uses through land tenure adjustment (Objective No. 5).

- Accommodate requests for land use authorizations while minimizing residual impacts to sensitive resources (Objective No. 6).

- Manage public lands to enhance, protect and minimize impacts to sensitive resources, including cultural and paleontological resources; and air and water quality (Objective No. 10).

Resource Area-Wide Allocations

- Unless otherwise identified, all public lands shall be retained in federal ownership (Allocation No. 1).

- Lands where BLM manages the mineral estate only (split estate lands) will be available for exchange through Section 206 of the Federal Land Policy Management Act (FLPMA), on a case by case basis (Allocation No. 6).

- Management Action shall conform to Visual Resource Management (VRM) classifications (Allocation No. 22).

- Activities on public land, including construction, road maintenance and improvement, oil development, pipeline corridors, and powerline corridors must comply with local Air Pollution Control District requirements (Allocation No. 29).

Lokern Area of Critical Environmental Concern (ACEC)

- Cooperative of local landowners and local, state, and federal government agencies to manage the Lokern ACEC as a natural ecosystem for the benefit of threatened and endangered species and their habitats, while recognizing the rights and needs of authorized users of public land.

Management Prescriptions

- This ACEC is open for leasing of oil, gas, and geothermal resources subject to the following stipulation: LSU-Protected Species, LSU-Sensitive Species.

PUBLIC FACILITIES

- In evaluating a development application, Kern County will consider impacts on the local school district(s) (Policy No. 8).

- A large part of the short-term threat to public health and local government resources is due to transportation of hazardous waste (as well as hazardous material in general). Disposal capacity will be permitted for waste streams which minimize the volume and distance of transportation (Policy No. 13).

- All generators and processors of hazardous waste are encouraged to develop long-term waste management programs. Large generators of hazardous waste should be encouraged to recycle, treat and detoxify their wastes on site. Many such processes could be implemented in existing industrial map designations, if zoned appropriately (Policy No. 17).

- Include consideration of fiscal impacts of development proposals, so that the character and extent of possible public service or facility deficiencies can be identified during the course of the normal project review process (Implementation B).

- Determine the local cost of facility and infrastructure improvements and expansion which are necessitated by new development of any type and prepare a schedule of charges to be levied on the developer at the time of approval of the Final Map (Implementation E).

- Ensure that the Superintendent of Schools and the respective school boards are informed of development proposals and are afforded the opportunity of evaluating their potential effect on the physical capacity of school facilities and their fiscal impact on locally originating revenue requirements. Their reports on

these impacts should be available on a timely fashion prior to final consideration and action by Kern County on a development application (Implementation J).

- Roads and highways utilized for commercial shipping of hazardous waste destined for disposal will be designated as such pursuant to Vehicle Code Sections 31030 et seq. Permit applications shall identify the commercial shipping routes they propose to utilize for particular waste streams (Implementation O).

ENERGY ELEMENT OF THE KERN COUNTY GENERAL PLAN

- The County shall encourage the development and upgrading of transmission lines and associated facilities (e.g., substations) as needed to serve Kern County's residents and access the County's generating resources, insofar as transmission lines do not create significant environmental or public health and safety hazards (Policy No. 1).

- The County shall review proposed transmission lines and their alignments for conformity with the Land Use Element of the Kern County General Plan (Policy No. 2).

- In reviewing proposals for new transmission lines and/or capacity, the County shall assert a preference for upgrade of existing lines and use of existing corridors where feasible (Policy No. 3).

- The County shall work with other agencies in establishing routes for proposed transmission lines (Policy No. 4).

- The County shall discourage the siting of above ground transmission lines in visually sensitive areas (Policy No. 5).

- The County should encourage new transmission lines to be sited/configured to avoid or minimize collision and electrocution hazards to raptors (Policy No. 6).

- The County should monitor the supply and demand of electrical transmission capacity locally and statewide (Implementation A).

- The County shall continue to maintain provisions in the Zoning Ordinance and update as necessary to provide for transmission line development (Implementation B).

KERN COUNTY ZONING CODE

The Kern County Zoning Ordinance was adopted in July 1997. The ordinance implements the Kern County General Plan by applying development standards and construction requirements on land as it is developed within the unincorporated areas of the county. The following divisions of the Kern County Zoning Ordinance apply to the project.

ZONING DISTRICTS

EXCLUSIVE AGRICULTURE (A)

Areas that are suitable for agricultural uses. This designation is designed to prevent the encroachment of incompatible uses onto agricultural lands and the premature conversion of such lands to non-agricultural uses. Permitted uses in the "A" District are limited primarily to agriculture and other activities compatible with agriculture.

LIMITED AGRICULTURE (A-1)

Areas that are suitable for a combination of estate-type residential development, agricultural uses, and other compatible uses.

NATURAL RESOURCE (NR)

Lands with this designation are productive or potentially productive petroleum, mineral, or timber resource areas; the designation is designed to prevent the encroachment of incompatible uses onto such lands. Uses in the "NR" District are limited to resource exploration, production and transportation, and to compatible activities.

ESTATE (E)

Areas that are suitable for larger lot residential living environments. Uses are limited to those typical of and compatible with, quiet residential neighborhoods. Uses permitted in the Estate District include agricultural, residential, commercial utility, communication facilities, resource extraction and energy development uses.

LOW-DENSITY RESIDENTIAL (R1)

Areas that are suitable for traditional smaller lot, single-family homes and compatible uses. Maximum density is limited to ten dwelling units per net acre.

Zoning Designations Within The Affected Environment

Location or Linear Facility	Zoning Designations
La Paloma Generating Plant	A
Route 1 (R1) Transmission Line Route	A, A1, E
Route 2 (R2) Water Supply Line Route	A
Route 4 (R4) Potable Water Supply Line Route	A, NR, R-1
Route 5 (R5) Natural Gas Supply Line	A

SETTING

The proposed project is located in western Kern County, about 35 miles west of Bakersfield, California. The 23-acre site is situated about two miles east of State Routes 58 and 33, and the community of McKittrick. The site is located along the north side of Skyline Road, east of the intersection of Reserve Road and Skyline Road. The site is within a declining oil production area and the only development near the site (except for the town of McKittrick) is associated with oil production. There are no parks, recreational, educational, religious, agricultural areas, health care facilities, or commercial uses on the site or within a one-mile radius of the site. The project is located within the administrative boundaries of the Asphalto oil field (Division 1998). Please refer to the **Project Description** section of this FSA for a map showing the regional location of the project.

TRANSMISSION LINE

As stated in the AFC, portions of the transmission line route traverse BLM lands within the Caliente Resource Management Area. The area encompasses about 590,000 acres of public land and 450,000 acres of federal-reserved mineral estate land. The Caliente Resource Management Area was established for the protection and recovery of threatened and endangered species and to promote oil and gas production. The sub-region of the Caliente Resource Management Area affected by the project is the Lokern Area of Critical Concern. Please refer to the **Biological Resources** section of the FSA for a discussion of the Lokern Area of Critical Concern.

The transmission line route passes within one mile of the towns of McKittrick and Buttonwillow, and within 0.25 mile of five residences southwest of Buttonwillow. There are no proposed residential developments within the area affected by the project and transmission line route. There are two schools within 0.8 mile of the transmission line route near the towns of McKittrick and Buttonwillow. These schools are not within the 0.5-mile study area for linear facilities but are considered sensitive uses. Please refer to the **Transmission Line Safety and Nuisance** section of the FSA for a discussion of potential impacts in this area.

AGRICULTURAL RESOURCES

Information contained in the AFC states that the majority of the proposed project components (power plant, western portion of the proposed transmission line, and all

offsite pipelines) are not located on areas of farmland considered by the California Department of Conservation to be Prime, of Statewide Importance, or Unique. Portions of the proposed Route 1 transmission line east of the aqueduct traverse land that does qualify as Prime Farmland, because it is currently used for irrigated row crops.

IMPACTS

CONSTRUCTION IMPACTS

An August 4, 1998, letter from Department of Conservation's Division of Oil, Gas, and Geothermal Resources (Division) states that the proposed project is located within the administrative boundaries of the Asphalto oil field. There are four wells on the plant site, previously owned by Chevron USA Inc, now owned by NAFTEX. One of the wells is plugged and abandoned (well no. 61), the other three are idle (well nos. 71R, 81, and 82). The Division has stated that the plugging and abandonment of well 61 does not meet current Division specifications, and if any structure is to be located over or in the proximity of the well, the well would have to be plugged to current Division specifications (Division 1998a). Section 3208.1 of the Public Resources Code authorizes the State Oil and Gas Supervisor to order the reabandonment of any previously plugged and abandoned well when construction of any structure over or in the proximity of the well could result in a hazard, or if construction has likely disturbed the integrity of the abandonment. The cost of reabandonment operations is the responsibility of the owner of the property upon which the structure will be located (Division 1998a).

Chevron USA Inc. has submitted applications and the Division issued permits to plug and abandon wells 71R, 81, and 82. Any additional project mitigation requirements due to the proximity of these wells to the proposed construction of the LPGP will be based upon the extent the permitted plugging and abandonment operations are completed (Division 1998b). Review of the AFC by the Division determined that there are numerous plugged, abandoned, idle, producing and injection wells within proximity of La Paloma's proposed linear facilities (transmission lines, towers, and conductors). Land Use Section 5.9.2.3 of the AFC does not note the presence of existing wells, or consider them a sensitive land use within the proposed transmission line corridor.

If development results in the construction of a structure within 50 feet of a well, the Division district office in Bakersfield must be contacted to investigate the condition of the wellhead and check for leakage. In addition, the Division recommends that no structure, pipeline or transmission line be built over or in proximity of a well location, as routine maintenance and abandonment operations require the erection of a portable derrick to conduct these and other operations. The Division recommends that La Paloma coordinate activities with well owners so pipeline and transmission line construction does not result in hazardous situations. The Division also requests that the wells be plotted accurately on all future maps related to this project, and that a legible copy of the final project map be submitted to the Division district office in Bakersfield.

Staff concurs with the Division's recommendation that La Paloma coordinate activities with well owners so pipeline and transmission line construction does not result in hazardous situations, and that La Paloma provide the Energy Commission and the Division's Bakersfield Office with a legible map of all linear facilities showing all wells within 50 feet of proposed corridors. La Paloma has stated that they will provide a map that indicates all wells. La Paloma will submit this map to the Division district office in Bakersfield prior to the FSA (Chilson 1999).

La Paloma has submitted the proposed routes of pipelines and transmission lines to the Division for their review. In response, the Division stated appropriate mitigation be proposed for the active and idle wells in proximity to the proposed transmission line and pipeline routes, and the four wells in the construction site and laydown areas (Division 1998a, Division 1998b, Chu 1999). The Division states that access must be retained to these wells so that they can be serviced by a portable derrick. The Occupational Safety and Health Administration (OSHA) regulations and industry safety policies require derricks to avoid high voltage powerlines and be setback by fifty feet at all times. The Division further states that because portable derricks must have a minimum of 125 feet clearance, adequate vertical clearance must be maintained to allow oversized oilfield equipment to pass beneath proposed transmission lines (Division 1998b). As stated in both letters, because of the complexity of issues involved in construction in an oilfield, the Division strongly recommends that La Paloma confer with the affected property owners and oilfield operators, and observe all necessary setbacks prior to construction. Please refer to the **Transmission Line Safety and Nuisance**, and **Facility Design** sections of the FSA for a discussion of these issues and appropriate mitigation.

The proposed Route 1 transmission line will involve construction in areas of existing corridors and will traverse areas of active and idle oil wells, and agricultural land. The proposed route parallels existing transmission lines over the majority of its length. About 10,000 square feet of land would be disturbed at each tubular tower during construction. As shown in Table 3.8-5 in the AFC, the estimated land disturbance for construction of the transmission line will total about 38 acres; about 139 acres would be disturbed for construction of the gas and water supply lines. Staff considers these impacts to be short-term and temporary since agricultural uses within the transmission line right-of-way would continue after construction. Some residences within the towns of McKittrick and Buttonwillow may experience short-term construction impacts such as increased noise, dust, traffic and vehicle emissions. Please refer to the **Noise, Traffic and Transportation, and Air Quality** sections of the FSA for a discussion of potential impacts in these areas.

The transmission line route will cross the abandoned Union Pacific railroad right-of-way at four locations between Buttonwillow and McKittrick, and will cross active tracks adjacent to State Highway 58 near Buttonwillow. La Paloma has submitted applications for five railroad right-of-way crossings to Union Pacific Railroad. The transmission line route will also cross State Highway 58 and four county roads. La Paloma has submitted an application for an encroachment permit to the Department of Transportation and the Kern County Roads Department. Please refer to the

Traffic and Transportation section of the FSA for a discussion of potential impacts and associated mitigation in these areas.

In Supplement 2 to the AFC, La Paloma has proposed a change in the transmission line route to avoid crossing a parcel owned by the State of California, Department of Fish and Game. Alternate Route B would cross undeveloped lands to avoid the California Department of Fish and Game property. Zoning districts within the proposed re-route area consist of lands zoned Exclusive Agriculture (A) and Limited Agriculture (A-1). Both zoning districts allow transmission lines as a permitted use. Because these lands are not irrigated, they do not qualify as Prime Farmland. No new property owners are affected by the proposed re-route.

If La Paloma complies with OSHA regulations and industry safety policies, and staff's proposed conditions of certification, Energy Commission staff does not expect land use impacts associated with construction activities to be significant.

OPERATION IMPACTS

As stated in the AFC, about 100 square feet of land would be taken out of production at each tubular tower structure along the route. Therefore, operation of the proposed Route 1 transmission line will permanently remove about 3.38 acres of farmland (an additional 1.08 acres due to the proposed re-route). Of this amount, about 0.04 acres are considered Prime Farmland. Staff does not consider this to be a significant impact due to the small amount of land taken out of production. La Paloma is currently negotiating easements with all property owners along the proposed transmission line route (Garnand 1999).

Because the proposed route parallels existing transmission lines over the majority of its length, crop dusting activities in the area have already adapted to the existing transmission lines. Please refer to the **Transmission Line Safety and Nuisance** section of the FSA for further discussion of aerial-related impacts). Therefore, staff does not anticipate significant impacts to agriculture practices. The project will be located on an existing oil and gas production field in an area designated for petroleum and energy-related uses, and for agricultural uses. For these reasons, staff does not expect significant impacts to land use associated with operation of the project.

CUMULATIVE IMPACTS

The proposed project and transmission line will not contribute to a significant change in the character of the area because the project is located within a declining oil production area, and the only development near the site (except for the town of McKittrick) is associated with oil production. The proposed transmission line will parallel 15 miles of an existing corridor and therefore, will not result in the conversion of a significant amount of agricultural lands to non-agricultural uses.

There are a total of four proposed projects (La Paloma, Sunrise, Elk Hills, and Midway) with transmission lines that are planned to terminate at the Midway substation. At this time there is not enough information to determine land uses in the immediate vicinity of the substation will be adversely affected.

CONSISTENCY WITH LAND USE PLANS, POLICIES, AND REGULATIONS

The project site is designated Extensive Agricultural, and Mineral and Petroleum in the Kern County General Plan. Based on policies in the Kern County General Plan, the project is compatible with existing land use designations. The site is zoned "A" (Exclusive Agriculture). Power plants are a conditional use in this zone. Therefore, for the project to be consistent with the Kern County Zoning Ordinance, the project must comply with certain conditions of approval, set forth by the Kern County Planning Department, and specified under **MITIGATION**, below.

The project also requires an amendment to the Circulation Element of the Kern County General Plan regarding deletion of three miles of future arterial and collector highway alignments. The Kern County Planning Department initiated the request for a general plan amendment to delete these three miles. The Kern County Board of Supervisors adopted General Plan Amendment Case No. 5, Map No.118 on December 7, 1998, approving the request.

FACILITY CLOSURE

PLANNED CLOSURE

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. Facility closure would have to comply with all applicable policies in the Kern County General Plan and ordinances in effect at the time of closure.

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency.

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

In February 1997, the Compliance Office of the Energy Commission conducted a Plant Closure Survey. The survey was sent to various local and state agencies to determine whether these agencies had any regulations or compliance procedures regarding the closure of power plants and other large industrial facilities. At that time, Kern County responded that they had no requirements for a closure plan and no requirements for site restoration. At present, Kern County has no specific requirements regarding closure and site restoration. However, they have requested

that any closure plans required by the Energy Commission be subject to an advisory review by Kern County. In that way, Kern County could provide site/project specific comments at that time (Rickels 1999).

MITIGATION

La Paloma has proposed four mitigation measures that they will implement for the proposed LPGP to avoid or minimize land use impacts associated with the construction and operation of the generating plant, transmission line route, and offsite pipeline facilities. Staff has incorporated La Paloma's four mitigation measures (listed below) into the proposed conditions of certification as **LAND-1**.

La Paloma's proposed mitigation is as follows:

- Comply with regulatory agency permits and requirements concerning land use issues.

- Develop small-scale construction scheduling where appropriate to avoid conflicts with agricultural operations.

- Where practicable, place tower structures to minimize direct adverse effects on agricultural areas (including row and/or field crops) and other important land use features. Time construction activities to avoid impacts to cultivated areas to the extent practical.

- If agricultural facilities (e.g. irrigation systems, fences, gates) are damaged, repair or replace these facilities.

Kern County normally would require a conditional use permit for this type of project. However, local agency requirements are superseded by Energy Commission action on certification. Therefore, staff has required La Paloma to prepare a development plant that addresses Kern County's zoning conditions of approval into the proposed conditions of certification as **LAND-1**. Kern County's zoning conditions of approval are stated below.

1. Prior to the issuance of any building or grading permits, the method of water supply and sewage disposal shall be as required by the Kern County Environmental Health Services Department.

2. Fire flows, access and fire protection facilities shall be as required by the Kern County Fire Department.

3. Prior to the issuance of any building or grading permits, a plan for the disposal of drainage waters originating on site and from adjacent road rights-of-way shall be reviewed by the Kern County Engineering and Survey Services Department/Floodplain Management Section, if required and commented on. Easements or grant deeds shall be given to the County of Kern for drainage purposes or access thereto, as necessary.

4. The development shall comply with any requirements of the San Joaquin Valley Unified Air Pollution Control District.

5. The property owner shall record an irrevocable offer of dedication of road right-of-way to the County of Kern of all subject property within 45 feet of the centerline of Skyline and Reserve Roads, including a 20 foot by 20 foot corner cutoff at intersecting streets, for secondary highway alignment purposes. Prior to recordation, said offer of dedication shall be reviewed by the Rights-of-Way Section of the Kern County Roads Department.

6. All of the subject property within 45 feet of the centerline of Skyline and Reserve Roads shall be improved to Type B Subdivision Standards, secondary highway amended to provide base and pavement tie to existing pavement if constructed to secondary highway or major highway standards. Existing pavement shall be saw cut at match point.

7. All obstructions, including utility poles and lines, trees, pole signs, or similar obstructions, shall be removed from the ultimate road rights-of-way in accordance with Section 18.55.030 of the Land Division Ordinance. Compliance with this requirement is the responsibility of the applicant and may result in significant financial expenditures.

8. A minimum of 8 on-site parking spaces shall be provided.

9. All vehicle parking and maneuvering areas around the four power islands shall be surfaced with a minimum of two inches of Asphalto Composite paving or material of higher quality.

10. All vehicle parking and maneuvering areas around the switchyard and cooling towers shall be surfaced with one of the following: three inches of decomposed granite, three inches of compacted rock dust, three inches of gravel, or three inches of a material of a higher quality.

11. Vehicle parking spaces shall be 9 feet by 20 feet or larger in size and shall be designated by white painted stripes, except as provided in Sections 19.82.030 and 19.82.040 of the Zoning Ordinance.

12. Parking lot or site illumination shall be directed away from adjoining properties and public roads.

13. A comprehensive landscaping and maintenance irrigation plan shall be approved by the Planning Director in accordance with the requirements of Chapter 19.86 of the Zoning Ordinance. A minimum of five percent of the total developed area shall be landscaped and continuously maintained in good condition. If the required parking area contains more than ten spaces, a minimum of 5 percent of the interior parking area shall be landscaped, with trees planted at a ratio of one tree per ten spaces. Parking area landscaping, if necessary, shall be in accordance with Section 19.82.090 of

the Zoning Ordinance and may be used in the calculation of total landscaping requirements. Landscaping shall be installed or bonded for prior to occupancy of the building or site.

14. During all on-site grading and construction activities, adequate measures shall be implemented to control fugitive dust.

15. All trash receptacles shall be screened in such a manner so that they are not visually obtrusive from any off-site location.

16. The areas devoted to outside storage shall be treated with a dust binder or other dust control measure, as approved by the Director of the Kern County Planning Department. Screening, if required by the base district regulations, shall also be provided.

Section 3208.1 of the Public Resources Code authorizes the State Oil and Gas Supervisor to order the reabandonment of any previously plugged and abandoned well when construction of any structure over or in the proximity of the well could result in a hazard, or if construction has likely disturbed the integrity of the abandonment. Therefore, the Division requires review of the LPGP development plan to determine the need for appropriate mitigation for the four wells located within the construction site and laydown areas. Energy Commission staff is proposing that La Paloma submit a development plan of the project for the Division's review and comment.

CONCLUSION AND RECOMMENDATION

CONCLUSION

Energy Commission staff analysis indicates that the project by itself, and cumulatively, will have no land use impacts that cannot be mitigated to a level below significance. If staff's conditions of certification are implemented, the project will comply with all applicable laws, ordinances, regulations, standards, plans and policies.

RECOMMENDATION

If the Commission certifies the proposed project, staff recommends that it adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

LAND USE-1 The project owner shall submit a development plan for the site to Kern County for their review and comment. The development plan shall contain a schedule for small-scale construction where appropriate to avoid conflicts with agricultural operations, a schedule discussing the timing of construction activities to avoid impacts to cultivated areas to the extent practical, a statement requiring the project owner or its subcontractors to repair or replace any agricultural facilities damaged by construction activities.

The project owner shall provide a letter of comment from the Kern County Planning Director.

Verification: At least 60 days prior to the start of construction, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a copy of the development plan, and a copy of the letter of comment from the Kern County Planning Director.

LAND USE-2 Transmission lines and pipelines shall be located with a minimum setback from oil wells (producing wells, idle wells or plugged and abandoned wells) of 50 feet. All above-ground transmission lines and pipelines shall be located with a minimum setback from oil wells of 125 feet in at least one direction, so that a portable derrick may be raised over the oil well.

Protocol: The project owner shall submit a project development plan addressing any actions to be undertaken by the project owner to ensure no hazard or problems will be created with the existing four wells in the construction site and laydown areas to the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) for review and comment. The development plan shall include a discussion of how a minimum setback from existing oil wells as identified above is to be maintained.

Verification: At least sixty days prior to the start of construction, the project owner shall submit to the CPM a copy of DOGGR's letter commenting on the development plan. Within fifteen (15) days of receipt of the development plan and the DOGGR comment letter on the plan, the CPM will either approve or comment and deny the plan, and transmit the approval or denial letter to the project owner.

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TRAFFIC AND TRANSPORTATION

Testimony of David Flores

INTRODUCTION

The Traffic and Transportation section of the Final Staff Assessment addresses the extent to which the project may impact the transportation system within the vicinity of its proposed location. This section summarizes the separate analyses by both the La Paloma Generating Company (La Paloma) in the Application for Certification (AFC) and the Energy Commission staff of the potential traffic and transportation impacts associated with construction and operation of the La Paloma Generating Project (LPGP). These analyses included the identification of: 1) the roads and routings which are proposed to be used; 2) potential traffic related problems associated with those routes; 3) the anticipated number of trips to deliver oversize/overweight equipment; 4) the anticipated encroachment upon public right-of-ways during the construction of the proposed project and associated appurtenant facilities; 5) the frequency of trips and probable routes associated with the delivery of hazardous materials; and 6) the availability of alternative transportation methods such as rail.

Staff has used this information to determine the potential for the project to have significant traffic and transportation impacts, as well as to assess the availability of mitigation measures which could reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to insure that the project complies with the applicable Laws, Ordinances, Regulations and Standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

The federal government addresses transportation of goods and materials in Title 49, Code of Federal Regulations:

- Title 49, Code of Federal Regulations, section 171-177, governs the transportation of hazardous materials, the type of materials defined as hazardous, and the marking of the transportation vehicles.

- Title 49, Code of Federal Regulations, section 350-399, and Appendices A-G, Federal Motor Carrier Regulations, addresses safety considerations for the transport of goods, materials and substances over public highways.

STATE

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and right-of-way. In addition, the California Health and

Safety Code addresses the transportation of hazardous materials. Specifically, these codes include:

- California Vehicle Code, section 353 defines hazardous materials.

- California Vehicle Code, sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.

- California Vehicle Code, section 31030, requires that permit applications shall identify the commercial shipping routes they propose to utilize for particular waste streams.

- California Vehicle Code, sections 31600-31620, regulates the transportation of explosive materials.

- California Vehicle Code, sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements.

- California Vehicle Code, sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases.

- California Vehicle Code, sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.

- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.4, 34501.10, 34505.5-7, 34507.5 and 34510-11, regulate the safe operation of vehicles, including those which are used for the transportation of hazardous materials.

- California Vehicle Code, sections 2500-2505, authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.

- California Vehicle Code, sections 13369, 15275, and 15278, address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials.

- California Streets and Highways Code, sections 117 and 660-72, and California Vehicle Code 35780 et seq., require permits for the transportation of oversized loads on county roads.

- California Streets and Highways Code, sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulate right-of-way encroachment and the granting of permits for the encroachment on state and county roads.

- California Health and Safety Code, sections 25160 et seq., address the safe transport of hazardous materials.

LOCAL

KERN COUNTY

The Circulation Element of the Kern County General Plan sets up local goals and guidance policies about building and transportation improvements. It introduces planning tools essential for achieving the local transportation goals and policies (County of Kern, 1972). Relevant goals and policies include, in part, the following:

PRIVATE DEVELOPMENT ACCESS TO EXISTING ROADWAY NETWORK

As a condition of private development approval, developers shall build roads needed to access the existing road network (Policy No. 1).

GROWTH BEYOND 2010

The County should monitor traffic volumes and patterns on County major highways (Policy No. 1).

Development applications must demonstrate that sufficient transportation capacity is available to serve the proposed project at Level of Service "D" (LOS D) or better.

TRUCKS ON HIGHWAYS

Make Caltrans aware of heavy truck activity on Kern County's roads (Policy No. 1).

Start a program that monitors truck traffic operations (Policy 2).

Promote a monitoring program of truck traffic operations (Policy 2).

TRUCKS ROUTES

The Transportation Management Department should oversee truck travel patterns and be aware of locations where heavy trucks traverse residential areas (Policy No. 1).

TRANSPORTATION OF HAZARDOUS MATERIALS

State maintained highways are acceptable as commercial hazardous waste transportation routes (Policy No. 1).

Kern County and affected cities should reduce use of county maintained roads and city maintained streets for transportation of hazardous materials (Policy No. 3).

Restrict commercial transportation of hazardous materials in accordance with Vehicle Code, section 31303 (Policy No. 4). This circulation element recommends charting routes where hazardous material shipments can go.

ROAD PAVEMENT DAMAGE

The County shall continue to maintain pavement conditions and check operating conditions by collection and review of traffic flow and accident data to rate the circulation system (Policy No. 1).

SETTING

REGIONAL DESCRIPTION

ROADWAYS AND HIGHWAYS

The project site is located in the McKittrick Valley, in the southwestern portion of Kern County. The power plant is located about 1.9 miles southeast of the community of McKittrick, and about 40 miles west of Bakersfield, California. The generating facility site is 23 acres in size and within a declining oil production area. From McKittrick, the project site is reached by traveling east on Reserve Road to its junction with Skyline Road. An asphalt-paved access road will be constructed from Skyline Road to the proposed site. The plant's administration building parking lot and the road encircling the power blocks will also be asphalt paved. Other roads on the plant site will be graveled.

The two highways that provide access to the plant site, Highways 33 and 58, each have the following weight and load limitations that result in permit requirements:

- greater than 80,000 lb. gross vehicle weight;
- higher than 8 feet;
- wider than 6 feet; and
- longer than 65 feet.

Table 1 represents data pertaining to the existing traffic characteristics on highways potentially affected by the proposed project, including:

- Highway 33 from Highway 166 to Highway 58;
- Highway 58 from Highway 33 to Highway 43;
- Highway 119 from Highway 33 to Highway 99;
- Interstate 5 from the Wheeler Ridge Road interchange to Highway 58;
- Highway 43 from Highway 119 to Highway 58;
- Highway 166 from Highway 33 to Highway 99; and
- Highway 99 from Interstate 5 to Highway 58.

The following table summarizes the existing conditions of the two county maintained roadways that will be affected by the proposed generating plant, Reserve Road and Skyline Road, which provide local access to the project site. The table identifies the roadway classification and annual average daily traffic (AADT) data, the capacity of the roads and LOS. Since LOS data was not available from Kern County, it was calculated by dividing the volume of traffic (AADT) by the capacity, a standard acceptable practice as presented in the Kern County General Plan Circulation Element (County of Kern, 1992). Other data not available from the County for these roads includes peak hour LOS, annual average truck traffic, and truck traffic counts.

TRAFFIC AND TRANSPORTATION Table 1
Existing Traffic Characteristics of Local Roadways in the Project Area

Roadway	Location	Classification	Annual Average Daily Traffic (V)[1]	Annual Peak Hour Traffic[2]	Capacity (C)[3]	LOS (V/C)[4]
Reserve Road	West of Skyline Road	2-lane local road	220	22	9,000	A
Skyline Road	East of Reserve Road	2-lane local road	140	14	9,000	A

SOURCE: La Paloma AFC Table 5.11-2
[1]1996 Traffic Census (Kern County Department of Transportation Management, 1997).
[2]Based on 10 percent of AADT.
[3]Kern County, 1998.
[4]LOS calculated by dividing volume (V) by capacity (C); and, and using the V/C ratio to define LOS (Kern County, 1998).

Although traffic counts specifically for trucks are not available for local roads, a large ratio of trucks to cars due to the number and proximity of the oil fields generally characterize traffic in the project vicinity. LPGP has assumed that 20 to 40 percent of the traffic along Reserve Road and Skyline Road is truck traffic. LOS on these roadways serving the project site is comprised of free flowing (LOS A) operating conditions.

IMPACTS

POWER PLANT

CONSTRUCTION PHASE

Construction of the generating plant facility will occur over an estimated 19-month period and will require a total construction workforce of 410 workers on average, assuming a single shift and a 40-hour five day work week. Of the 410 workers, approximately 55 will be contractor-staff. During the peak construction period (in the 18th month after the notice to proceed) an estimated 727 workers will be required for the generating plant. The distribution of workforce is therefore based on these numbers. Workforce vehicles were calculated based on this data.

Staff agrees with the AFC's worst case scenario, in that it assumes that each of the 410 workers will drive a separate vehicle to the project site, making two trips per day (one round trip from home to the site and back).

Therefore, construction of the project could result in a total of approximately 820 vehicle trips per day on average, and about 1,454 vehicle trips during the peak construction period. Parking for construction personnel and visitors will be provided in an area on or adjacent to the project site.

Workers originating in Shafter or Wasco will use Highway 43 south to Highway 58 west, then take Highway 33 south to Reserve Road, and east to Skyline Road to the plant site. From Taft, Ford or Maricopa, workers will use Highway 33 north to Reserve Road, then east to Skyline Road to the plant site. Construction related workers coming from other cities or towns in Kern County or from Southern California will likely use I-5 north to Highway 166 west, then take Highway 33 north to Reserve Road, then east to Skyline Road to the plant site.

Using the traffic pattern assumptions described above, construction related vehicle traffic would affect Highways 33, 43, and 58 most heavily, resulting in traffic increases of 25-35 percent along portions of those highways. The proposed project is anticipated to reduce the existing LOS from B to C on Highway 58 (at the Lokern Road and Buttonwillow Drive junctions) and Highway 43 (at the junction of Highway 58 east), and from LOS C to D on Highway 33 (at the junction of Highway 58 east).

Construction workforce traffic would generally occur between 6:00 a.m. and 7:00 a.m. in the morning, and again between 4:00 p.m. and 5:00 p.m. in the evening. This schedule is not anticipated to conflict with traffic related to McKittrick Elementary School, located along Highway 58, which is open from 8:15 a.m. to 2:40 p.m.

The two lane county maintained roads providing access from the state highways to the project site (specifically Reserve Road and Skyline Road) will be most affected by construction workforce traffic commuting to and from the project site. During the peak construction period, traffic on Reserve Road and Skyline Road, east of Highway 58, will increase by 1,454-vehicle trips/day (resulting in a traffic increase of 661% and 1,039%, respectively). The increase in traffic will be most apparent during the morning and evening peak commute hours between approximately 6:00 a.m. and 7:00 a.m., and again between 5:00 p.m. and 6:00 p.m. each day. Construction-related increases will occur over a moderate period of time, 19 months.

Both Reserve Road and Skyline Road have a capacity of 9,000 vehicles per day. Because existing average daily traffic on these local roads is negligible, the roads will be able to accommodate the project-related increases in traffic without reducing their LOS to a significant adverse level (i.e. LOS E or F).

The peak period traffic increases estimated above (1,454) will also be far below the capacities of both Reserve Road and Skyline Road, and will result in a LOS of C.

TRUCK TRAFFIC

Construction of the generating plant will require the use and installation of heavy equipment and associated systems and structures. Heavy equipment will be used throughout the construction period, including trenching and earthmoving equipment, forklifts, cranes, cement mixers and drilling equipment.

In addition to deliveries of heavy equipment, construction materials such as concrete, wire, pipe, cable, fuels and reinforcing steel will be delivered to the site by truck. An estimated 8,274 truck deliveries will be made to the plant site over the course of the 19 month construction period (on average approximately 435 truck deliveries per month). Assuming 20 average workdays per month and two trips for each truck delivery (one to and one from the site), the project will generate approximately 44 truck trips per day, on average. Deliveries will also include hazardous materials to be used during project construction. Deliveries will occur between 7:00 a.m. and 5:00 p.m. on weekdays. LPGP has assumed that the majority of these materials will be transported from either Bakersfield or Los Angeles.

LPGP has assumed that about 70 percent of the truck deliveries would originate in Bakersfield and drivers would use Highway 58 west to Highway 33 south to the plant site. About 20 percent of the deliveries are assumed to originate from the Los Angeles area; drivers would use I-5 north to Highway 166 west to Highway 33 north to the project site. The remaining truck deliveries will originate north of Bakersfield, would travel via I-5 south to Highway 58 west to Highway 33, and south to the project site.

Table 2 compares the construction related truck traffic traveling to the generating plant site with existing automobile and truck traffic on highway routes. The average influx of 22 trucks per day on the highways that will be used for access to the site is minimal compared to existing truck traffic on these highways and will represent a negligible increase (0.1 to 4.1 percent) in truck traffic along the proposed routes of travel. Therefore, the impact of construction-related truck traffic on highways will not be significant.

Trucks traveling on county roads to the project site will use Reserve Road and Skyline Road. Construction-related truck traffic will result in a 20 percent increase in traffic on Reserve Road, and a 31 percent increase in traffic on Skyline Road. Due to the size and weight of these trucks, these increases will contribute to the wear on the roads, subsequently increasing the need for regular roadway maintenance to meet safety standards. Staff has proposed a mitigation measure to ensure that damage to specific roadways, resulting from the La Paloma project, will be repaired by the project owner (see proposed condition of certification TRANS-6).

TRAFFIC AND TRANSPORTATION Table 2
Distribution Of Plant Construction Related Truck Traffic On Highways

Highway	Existing AADT	Existing Truck AADT	Project Average Truck Trips/Day[1]	Average Increase (%)
Interstate 5 @jct. Hwy 166 @jct. Hwy 58	 23,000 23,500	 4,275 7,520	 9[2] 4[3]	 0.2 0.1
Highway 166 @ jct. Hwy 33 North	 3,750	 862	 9[2]	 1.0
Highway 58 @ jct. Lokern Rd @ jct. Hwy 58 East	 2,750 2,700	 852 1,061	 35[3, 4] 35[3, 4]	 4.1 3.3

Source: La Paloma AFC Table 5.11-6
[1]Assumes an average of 435 truck deliveries each month, generating approximately 22 truck deliveries per day, i.e., 44 trips/day on average during construction period.
[2]20% from Los Angeles area using I-5 north to Highway 166 west to Highway 33 north.
[3]10% from north of Bakersfield using I-5 south to Highway 58 west to Highway 33 south.
[4]Assumes 70% deliveries from Bakersfield using Highway 58 west to Highway 33 south.

Transportation of equipment that will exceed the load size and limits of certain roadways will require special permits. The procedures and processes for obtaining such permits are fairly straightforward. Mitigation measures and conditions of certification that ensure compliance with these requirements are discussed later in this section.

Construction debris and small quantities of hazardous wastes will be generated during project construction as described in the Waste Management Section of this report. During construction, no more than several trucks per month will be required to haul waste for disposal. Transportation of hazardous materials to and from the project will be conducted in accordance with California Vehicle Code Section 31300 et seq. because Kern County does not have local ordinances regulating the transportation of hazardous materials. Since the transport of hazardous wastes will be conducted in accordance with transportation regulations governing such transport, no significant impact is expected.

RAILWAYS

An existing Union Pacific railroad spur is located in the vicinity of Buttonwillow and is located approximately 12 miles from the project site. LPGP has indicated that they currently have no specific plans to use the rail spur to deliver equipment. If economically feasible over trucking, the railroad spur could be utilized to deliver large equipment such as the combustion turbines. Staff for purposes of analysis, assume truck deliveries of equipment and materials.

OPERATIONAL PHASE

COMMUTE TRAFFIC

Potential long-term traffic impacts are associated with the facility's operational workforce. Operation of the generating plant will require a labor force of approximately 35 full-time employees. Assuming that each employee will drive a separate vehicle to work and that they will make one round trip from home to work per day, operation of the plant will generate approximately 70 vehicle trips per day. Adequate parking will be made available for employees on a paved lot adjacent to the administration building. LPGP has assumed that the majority of the permanent workforce will reside in Bakersfield and their preferred route to work will be westerly along Highway 58 to Highway 33, then south to Reserve Road, then easterly along Skyline Road to the project site. These avenues of travel will accommodate the estimated operations related traffic.

TRUCK TRAFFIC

The transportation and handling of hazardous substances associated with the project can increase road hazard potential. The handling and disposal of hazardous substances are addressed in the Waste Management Section, and the Hazardous Materials Section of the report.

During project operation, approximately 11 truck deliveries per month of aqueous ammonia will be made to the plant site. Other hazardous and non-hazardous materials as described in the Waste Management and Hazardous Materials Sections of this report will be delivered by truck to the plant site on an incidental basis. The anticipated travel routes for materials delivery will be along Highway 33 and/or Highway 58.

On September 24, 1998, staff contacted Ms. Marta Frausto with CALTRANS to review a portion of State Route 58 near the McKittrick Elementary School to determine if sufficient safety measures (ie.guard rails) were in place near the school to protect children in the event of a aqueous gas tank truck mishap. Ms. Frausto indicated that their traffic engineers would review the area to determine if additional safety measures were warranted.

On October 17, 1998, Ms. Frausto contacted staff by telephone indicating that upon field investigation by CALTRANS personnel in the area, determined that no additional safety measures were necessary. Based upon this information, staff has not recommended mitigation measures based upon their results.

Some of the hazardous material generated at the site during plant operation will be transported for disposal at a Class I landfill or transported offsite for recycling as described in the Waste Management Section of this PSA report. LPGP has estimated that hazardous waste generated onsite will be transported offsite for disposal about every 90 days by licensed hazardous waste transporters.

Potential impacts of the transportation of hazardous materials can be mitigated to a level of insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this section.

LINEAR FACILITIES

Potential impacts associated with the transmission line route include both construction and operation related impacts. Construction related impacts will result from the movement of heavy equipment, trucks, and worker vehicles along access routes during construction of transmission line towers and installation of conductors.

While this work will not directly impact traffic operations (staging areas will be established within existing rights of way or adjacent to existing rights of way on separate property) several aspects of transmission line tower construction and conductor installation could potentially result in impacts. These include: 1) workforce related traffic; 2) access to proposed tower structure locations; 3) transmission line roadway crossings; and 4) construction equipment and materials deliveries. These issues are discussed below.

Construction of the transmission line along the route is anticipated to take 8 months and require between 13 and 23 workers per month during the surveying, site clearing, and grading. During installation of the conductors, the workforce will peak at 23 workers during the 10th and 11th months following the notice to proceed. This peak construction period does not coincide with the peak construction associated with the generating plant (during the 18th month).

Construction activities associated with the generating plant, transmission line and pipelines will occur simultaneously during the 13th month following the notice to proceed. However, the total workforce at the time will be less than the workforce that will be active during the peak construction period (18th month) for the generating plant only. Furthermore, the distribution of the transmission line construction workforce will be along the length of the route. It is further assumed that construction will be completed by several crews working simultaneously along the route to minimize the construction period.

Two staging areas will be established for the transmission line to store equipment and materials and to provide field offices: one at the generating plant site and another at the Midway substation. Employees will report to these staging areas at the beginning and the end of each work day, then distribute themselves as needed to various work sites along the transmission line route. For these reasons, and the following reasons related to tower access, the local roadways and highways will not be significantly impacted by workforce-related traffic associated with construction of the transmission line.

Access to the tower structures for the transmission line will be along trails created for the water supply line construction between the generating plant and its terminus. If the water supply line is rerouted such that it no longer parallels the transmission

line, construction access will be over the existing Midway-Sunset and Diablo transmission line access roads with short spurs to the tower sites.

Where road spurs are required, they will generally be less than one mile in length. Spur roads will require some grading to clear existing ground cover, but the roadway surface will be the natural terrain. There are no plans for abandonment of these spur roads since they will provide access for maintenance of the transmission line. The spur roads will continue to be maintained by La Paloma for these purposes. Neither the construction of any potential spur roads, nor their use during transmission tower construction will adversely affect the existing county roadways.

For these reasons, construction of the towers for the transmission line route will not result in any significant traffic and transportation related impacts.

The transmission line route will cross Highway 58 at approximately Route 1, MP13.2. The crossing is anticipated to take from 10-12 hours, and require an encroachment permit from Caltrans.

Crossing of all local roadways will occur in accordance with permitting requirements. Crossings of county maintained roads will also require encroachment permits from Kern County Transportation Management Department.

Construction of the transmission line will require the use and installation of heavy equipment, including various trucks (pickups, booms, cement and digger/auger), mobile cranes, a cable puller and a helicopter. An estimated 16 pieces of heavy equipment will be used during the transmission line's peak construction period.

In addition to deliveries of heavy equipment, construction materials such as tubular steel pole foundation sections, tubular steel poles, and consumables will be delivered by truck to the transmission line staging sites. An estimated total of 210 truck deliveries will be made to the staging sites over the course of the 5 month delivery period (months 9 through 13), peaking at 65 deliveries during months 10 and 11.

In some cases, vehicles used to transport heavy machinery and construction materials and equipment will require a transportation permit from Caltrans, as described above for transmission line construction.

Given the small number of truck deliveries, and their distribution among multiple staging sites and work areas, traffic impacts associated with construction equipment and materials deliveries for the transmission line are considered to be insignificant.

On December 7, 1998, the applicant amended its application to include the construction of a water storage reservoir tank. Construction of the tank would be concurrent with the pipeline construction activities. The number of truck trips will increase slightly (5 additional truck trips for 10 days) for hauling excavated material. The impact associated with this construction activity is minor and does not change the conclusions presented in this report.

Given the small number of truck deliveries (approximately 247 truck deliveries will be made to staging sites over a 6 month period), and their distribution among multiple staging sites and work areas, traffic impacts associated with construction equipment and materials deliveries for the water and gas supply lines are considered insignificant.

CUMULATIVE IMPACTS

The analysis of the available capacity of the regional highways described in this section shows that the regional transportation system serving the Kern County area (along the potentially affected highways) has ample capacity to accommodate the proposed project's construction and operation generated traffic.

The other proposed projects in the area are the Sunrise Cogeneration (Sunrise) and Power Project, Elk Hills and Midway-Sunset Power Projects. During construction of the La Paloma Generating project, no cumulative impacts on traffic are expected for the following reasons:

- Peak construction traffic at the LPGP will occur before peak construction of the aforementioned power plant proposals.

- Traffic for the LPGP will not use the same access roads used by Sunrise, Elk Hills, and Midway-Sunset Power Projects.

- After the aforementioned power plants are constructed, they will operate 7 days a week, 24 hours per day. Assuming each of the other proposed plants uses the same number of operating personnel as the LPGP (approximately 35 employees) Monday through Friday of each week, this small number of commuters from each of the plants will not significantly impact current traffic patterns.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

LA PALOMA has stated its intention to comply with all federal LORS. A condition to insure compliance is included below. Therefore, the project is considered consistent with identified federal LORS.

STATE

LA PALOMA has stated its intention to comply with all state LORS. A condition to insure compliance is included below. Therefore, the project is considered consistent with identified state LORS.

LOCAL

For operational employees, trip reduction measures could be employed. But since the maximum number of employees assigned to any one shift is 35, trip reduction measures are not necessary for this project.

FACILITY CLOSURE

INTRODUCTION

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure**.**

PLANNED CLOSURE

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The applicant will prepare a Facility Closure Plan for submittal to the Energy Commission for review and approval, at least twelve months prior to the proposed closure. At the time of closure, all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. From the perspective of traffic and transportation issues, in the event of temporary facility closure, the applicant would have to comply with all applicable policies contained in the LORS section of this report in respect to transportation permits for hazardous materials and equipment deliveries and removal.

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. Staff assumes that the facility will either remain idle until such time that new ownership is established, or dismantling of the facility will occur. In any event, the owner will have to secure applicable transportation permits to satisfy the LORS requirements as stated in this report.

In the event of temporary closure, the effects on traffic and transportation would be similar to those for normal operation of the power plant facility. In the event of permanent closure, the effects would be similar to those associated with project construction. Permanent closure will involve a peak work period with commute traffic. In either instance, the roadway systems within the vicinity of the project should be able to handle traffic without affecting the current level of service of the area (LOS C during normal daytime traffic and LOS D during peak hour traffic).

MITIGATION

La Paloma has indicated its intention to comply with all LORS relating to: 1) the transport of oversized loads, 2) the transport of hazardous materials and 3) implementation of a program which addresses lighting and traffic control measures for construction activities on or adjacent to public roads, such as linear components, in accordance with Kern County General Plan (Circulation Element) policies.

STAFF'S PROPOSED MITIGATION

Staff has proposed mitigation measures to address the repair of roadway pavement due to truck traffic impacts during construction, and implementation of a traffic control plan. With these mitigation measures, the traffic and transportation issues will be reduced to less than significant.

CONCLUSIONS AND RECOMMENDATIONS

POWER PLANT

5. The transportation of hazardous during the construction phase, increased roadway demand resulting from the daily movement of workers and materials, while noticeable, will not increase beyond thresholds established by local and regional authorities.

6. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal.

7. All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate substances.

LINEAR FACILITIES

8. Construction of the transmission lines will have minimal impacts on the function of area roadways. Routine construction safety measures should be sufficient to ensure no impacts.

9. Because construction requires trenching within public road rights-of-way, the installation of underground facilities will impact both roadway function and levels of service. However, these impacts are expected to be short-term and not result in significant traffic and transportation impacts. La Paloma has indicated their intent to provide appropriate traffic control measures, and these are contained within the conditions of certification. In addition, all development will take place in compliance with California Department of Transportation (Caltrans) and Kern County limitations for encroachment into public rights-of-way.

Therefore, staff concludes that there will be no significant adverse impacts in the area of traffic and transportation as a result of the La Paloma project.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with Caltrans and Kern County limitation on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

Verification: In the Monthly Compliance Reports, the project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-2 The project owner or its contractor shall comply with Caltrans and Kern County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans (for temporary signalization during construction at the intersections of SR 58/SR 33 and SR 33/Reserve Road if necessary) and all relevant jurisdictions.

Verification: In Monthly Compliance Reports, the project owner shall submit copies of any encroachment permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-3 The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

Verification: The project owner shall include in its Monthly Compliance Reports, copies of all permits/licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

TRANS-4 Prior to the start of construction, the project owner shall consult with Kern County, and prepare and submit to the CPM a construction traffic control plan and implementation program which addresses the following issues:

- timing of heavy equipment and building materials deliveries;
- signing, lighting, and traffic control device placement;
- establishing construction work hours outside of peak traffic periods;

- emergency access;
- temporary travel lane closures;
- maintaining access to adjacent residential and commercial property; and
- off street employee parking in construction areas during peak construction.

Verification: At least thirty days prior to start of construction, the project owner shall provide to the CPM for review and approval, a copy of its construction traffic control plan and implementation program.

TRANS-5 The project owner or its contractor shall install crossing structures and netting across major thoroughfares as a safety precaution and to reduce the potential for damage from falling construction materials or equipment during cable-stringing activities. Prior to start of construction, the project owner shall consult with Caltrans, and prepare and submit to the CPM a safety plan and implementation program.

Verification: At least thirty days prior to start of construction, the project owner shall provide to the CPM for review and approval, a copy of its safety plan and implementation program.

TRANS-6 Following construction of the power plant and all related facilities, the project owner shall meet with the CPM and Kern County to determine the actions necessary and schedule to complete the repair of all roadways to original or as near original condition as possible.

Protocol: At least thirty days prior to start of construction, the project owner shall photograph the primary routes to be used by construction traffic (from the junction of Hwy. 33 easterly along Reserve Road to Skyline Road to the project site) and those that will be affected by pipeline construction (at Reserve Road just west of the intersection with Skyline Road). The property owner shall provide the CPM and Kern County with a copy of these photographs.

Verification: Within 30 days of the completion of project construction, the project owner shall meet with the CPM and Kern County. The project owner shall provide a copy of a letter from Kern County acknowledging satisfactory completion of the roadway repairs in the first Annual Compliance Report following start of operation of the La Paloma project.

TRANS-7 The project owner shall conduct a detailed traffic analysis at the Intersections of State Route 58 /State Route 33 and State Route 33 /Reserve Road to determine if additional roadway improvements for left and right turn channelization will be needed.

Verification: Traffic analysis shall be completed prior to project construction. The project owner shall meet with CALTRANS to determine scheduling of either

temporary or permanent roadways improvements, based on the traffic analysis. The project owner shall provide a copy of a letter from CALTRANS acknowledging acceptance of the roadway improvements in the first Annual Compliance Report following start of operation of the La Paloma project.

REFERENCES

Caltrans - Caltrans Office of System Planning - personal communication with M. Frausto.

Community of Buttonwillow - Buttonwillow Community Development Plan, 1974

Kern County - Kern County General Plan, 1992

Kern County Resource Management Agency/Roads Department, Office Memorandum, September 14,1998.

LPGP (La Paloma Generating Project). 1998a. Application for Certification, La Paloma Generating Project (98-AFC-2). Submitted to the California Energy Commission, August 26.

LPGP (La Paloma Generating Project). 1998. Application for Certification, addendum V, La Paloma Generating Project (98-AFC-2). A supplement that presents modifications to the various features of the AFC, such as a minor change to the routing of the raw water supply pipeline, addition of a large water storage reservoir tank, and clarifications to the AFC. Submitted to the California Energy Commission, December 7.

NOISE

Testimony of Kisabuli

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night during which it is produced, and the proximity of the facility to any sensitive receptors combine to determine whether the La Paloma Generating Project (LPGP) will meet applicable noise control laws and ordinances, and whether it will exhibit significant adverse environmental impacts.

The purpose of this analysis is to identify the likely noise impacts from the LPGP; and to recommend procedures to ensure that the resulting noise impacts will comply with applicable laws and ordinances, and will be adequately mitigated.

Before certifying the LPGP, the Energy Commission must find that:

10. the LPGP will likely be built and operated in compliance with all applicable noise laws, ordinances, regulations and standards; and
11. the LPGP will present no significant adverse noise impacts, or none that have not been mitigated to the extent feasible.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Occupational Safety and Health Act of 1970 (29 USCA § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910 et seq.) that establish maximum noise levels to which workers at a facility may be exposed. These OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time during which the worker is exposed. (Please see **Noise: Appendix A, Table A4** immediately following this section.) OSHA regulations also dictate hearing conservation program requirements and workplace noise monitoring requirements.

There are no federal laws governing offsite (community) noise.

STATE

Similarly, there are no state regulations governing offsite (community) noise. Rather, state-planning law (Gov. Code, § 65302) requires that local authorities such as counties or cities prepare and adopt a general plan. Government Code section 65302(g) requires that a noise element be prepared as part of the general plan to establish acceptable noise limits. Other state LORS include CEQA and Cal-OSHA.

The California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, § 5095 et seq.) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. The CEQA Guidelines (Cal. Code Regs., tit. 14, Appendix G) explain that a significant effect from noise may exist if a project would result in:

1. "Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

2. "Exposure of persons to or generation of excessive ground vibration or ground-borne noise levels.

3. "A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

4. "A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project."

LOCAL

KERN COUNTY GENERAL PLAN - NOISE ELEMENT

Kern County has established environmental noise limits based on the land use of the property receiving the noise. The permissible noise levels are outlined below.

NOISE: Table 1
Kern County General Plan-Noise Element

Land Use Category	Maximum Permissible Sound Level		
	L_{50} (Day)	L_{50} (Night)	L_{dn} (CNEL)
Non-sensitive Land Uses	65	60	75
Moderately Sensitive Land Uses	60	55	70
Sensitive Land Uses	55	45	65
Highly Sensitive Land Uses	50	40	60

The nearest noise sensitive receptors to the LPGP site include residences within McKittrick. According to the Kern County Noise Element, these single-family rural dwellings would be classified as Highly Sensitive Land Uses. As such, the

maximum allowable noise level from the LPGP at the residential properties is the L_{50} (Night) of 40 dBA.

SETTING

The proposed LPGP site is located within the McKittrick Valley, approximately 8,000 feet east of the community of McKittrick. The closest residence to the facility is located within McKittrick. The LPGP site is located in a rural setting, surrounded by open lands containing scattered oil wells, pipelines, compressors and tanks.

The existing ambient noise environment is very quiet in nature. The primary ambient noise sources are local traffic along Route 33, occasional local traffic along Skyline Road, and the background noise from the oil field equipment.

AMBIENT NOISE SURVEY

A noise survey was conducted, by the applicant, to assess the existing ambient noise conditions at the site and surrounding community. The ambient noise survey was conducted from Monday, May 4 through Wednesday, May 6, 1998.

Continuous noise measurements were recorded at three locations (LPGP 1998a, AFC page 5.12-2 and Figure 5.12-1). Location 1 is at the southwest corner of the LPGP site. Location 2 is at the northeast corner of the LPGP site. Location 3 is in McKittrick at the nearest residence to the LPGP site. Intermittent measurements were also recorded at each of these three locations.

The continuous measured noise levels are included in Tables 5.12-1 through 5.12-3 for locations 1 through 3, respectively (LPGP 1998a, AFC pages 5.12-5 through 5.12-7). The intermittent noise measurements are included in Table 5.12-4 (LPGP 1998a, AFC page 5.12-8).

Sound levels at each of the three locations were very low at night. The residual (L_{90}) or background noise levels ranged from 34 to 43 dBA during the nighttime hours. The only audible noise sources were occasional traffic along Route 33 and noise generated by the existing oil wells and other associated equipment.

The following is a summary of the 24-hour average levels recorded at measurement locations 1 through 3 (LPGP 1998a, AFC page 5.12-8):

Noise: Table 2
Summary of 24-hour Average Noise Levels

Location	L_{dn}	CNEL	$L_{eq}(24)$
Location 1 (Site)	53.7	53.8	51.1
Location 2 (Site)	55.4	55.4	50.1
Location 3 (Residence)	49.2	49.4	42.7

The closest residence to the facility is located on the east side of McKittrick, approximately 8,000 feet west of the site. The residences within McKittrick have a direct line-of-sight to the proposed facility location. The next closest residences are located in the community of Derby Acres, approximately 16,000 feet to the south. The residences of this town are located more than three miles from the site and there are interceding hills, which block any direct line-of-sight. Therefore, the residences of Derby Acres are not expected to be impacted by noise from the LPGP.

NOISE IMPACTS

LPGP noise impacts can be created by construction and by normal operation of the power plant.

CONSTRUCTION NOISE IMPACTS

Construction of the LPGP is scheduled to last about 24 months (LPGP 1998a, AFC page 1-2), with varying degrees of activity occurring, during the different phases of construction. Construction phases include: 1) excavation; 2) concrete pouring; 3) steel erection; 4) mechanical component installation; and 5) clean up. Construction noise impacts should be typical of powerplant construction activities. Major noise sources associated with most large industrial construction include: air compressors, track hoes, backhoes, graders, bulldozers, scrapers, front-end loaders, cranes, generators, boom tracks and the various trucks and smaller vehicles. The exact noise levels are a complex function of the actual noise levels emitted from each major noise-emitting piece of equipment, and their relative location and orientation within the construction area. To estimate the plant construction noise impacts, the composite noise levels listed in Table 3 below are used.

Noise: Table 3
Construction equipment and composite site noise levels.

Construction Phase	Noise Construction Equipment	Equipment Noise Level (dBA)	Composite Site Noise Level @ 50 ft. (dBA)
Excavation	Pile driver Dump truck Rock drill	101 91 98	89
Concrete pouring	Truck Concrete mixer	91 85	78
Steel erection	Derrick crane Jack hammer	88 88	87
Mechanical	Derrick crane Pneumatic tools	88 86	87
Clean-up	Truck Steam blow unmuffled)	91 110 @ 1,000'	89

Source: EPA, 1971 and Barnes, 1976.

The composite noise levels are based on intensive noise monitoring during the construction of 15 actual power plants. The noise monitoring for the composite levels was done at locations selected to avoid undue excess attenuation from

atmospheric conditions and terrain. The construction equipment were characterized as typical.

One important consideration in using these data is that the measurements are over 20 years old. Thus, they probably overestimate actual construction noise (there has been a trend towards quieter equipment in the intervening years). In spite of this consideration, these data are comprehensive and have the advantage of integrating significant variability to arrive at an average impact from each phase of construction.

STEAM BLOWS

Typically, the loudest noise, inherent in the construction of all projects incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feedwater and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale, and construction debris such as weld spatter, dropped welding rods, and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before connecting the steam system to the turbine, the steam line is temporarily routed to the atmosphere. Steam is then raised in the HRSG or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is quite effective at cleaning out the steam system piping. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

These steam blows can produce noise as loud as 130 dBA at a distance of 100 feet; this would attenuate to about 95 dBA at the nearest residence, exceedingly disturbing. Steam blow piping can be equipped with temporary silencers, which can reduce noise levels to 100 dBA or so at 100 feet, or 65 to 70 dBA at the nearest residence. Staff recommends that such silencers be installed during steam blows (see proposed Condition of Certification **NOISE-4** below).

Alternatively, the project owner may elect to employ a new, quieter steam blow process, variously referred to as QuietBlow® or Silentsteam™. This method uses lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet, equivalent to 40 to 45 dBA at the nearest residence. This noise level complies with the Kern County noise element of the general plan. This relatively short-term impact should not significantly disrupt the project's neighbors. Staff proposes a notification process (see proposed Condition of Certification **NOISE-5** below) to make neighbors aware of impending steam blows; this should help render the process tolerable.

LINEAR FACILITIES

Construction of the water pipeline and transmission line will produce noise. This noise will be noticeable, and possibly annoying, to persons outside their homes at those residences nearest the construction. This work, however, is only a temporary

phenomenon; the work will progress at such a pace that no single receptor will be inconvenienced for more than a few days. In addition, such work is customarily performed during the daytime, and would cause no impacts at night, when quiet is most important. While no LORS are in effect to assure daytime-only construction, staff has proposed a noise complaint process (see proposed Conditions of Certification **NOISE-1** and **NOISE-2**, below) that will allow any person suffering annoyance to address the problem with the applicant. Staff has also proposed a Condition of Certification (**NOISE-8**, below) to restrict noisy construction work to the hours specified in the applicable LORS, above. Staff believes no significant adverse noise impacts are likely to occur due to construction of the linear facilities.

CUMULATIVE NOISE IMPACTS

There are no industrial developments planned in the vicinity of the project site during the construction period of the project. Therefore, construction noise impacts from the facility will not contribute significantly to cumulative noise impacts in the area.

COMMUNITY NOISE EXPOSURE

The approximate 8,000-foot wide buffer zone to the nearest sensitive receptor will allow for significant attenuation of sound levels produced during the construction of the project and related facilities. Geometric or hemispherical spreading of the sound waves alone will reduce the sound levels by about 45 dBA at 8,000 feet. Other attenuating mechanisms, such as atmospheric absorption and ground effects, will reduce the levels by another 15 to 25 dBA depending upon atmospheric conditions.

The composite noise levels in NOISE Table 3 were used to predict noise levels in the community of McKittrick, using simple spherical divergence of the sound wave energy from the reference distance of 50 feet. The results of this modeling approach indicate that construction noise is expected to range from 35 to 45 dBA. This noise level will barely be audible in the community of McKittrick.

These sound levels should occur primarily during the daytime hours. Based on these assessments, construction noise levels in this range are not anticipated to cause any disturbance to local residents.

WORKER NOISE EXPOSURE

A reference distance of 50 feet was used to evaluate on-site construction noise levels and their potential impacts on workers. On-site noise levels were estimated using the approach described above. The noise levels will vary significantly depending on whether a worker is closer to or conducting a noisy activity, but the L_{eq} levels are projected to average between 75 and 85 dBA during the first four phases of construction. Undoubtedly, some workers will be occasionally exposed to noise levels above 85 dBA during construction. The applicant recognizes the need to protect construction personnel from noise hazards (LPGP 1998a, AFC page 5.12-13, 5.12-18). The applicant predicts that construction noise levels (other than steam blows) will not reach levels that require worker protection, but will put in place a hearing conservation program for employees who may be exposed to high levels

of noise. To ensure that workers are adequately protected, staff has proposed a condition of certification (see proposed Condition of Certification **NOISE-3**, below).

MITIGATION MEASURES

Due to the large buffer between the site and sensitive receptors, no noise mitigation will be required for normal plant construction activities. However, the steam blow activity conducted near the end of plant construction will require mitigation to avoid creating significant noise impacts. A temporary silencer will be fitted to the steam blow discharge point to reduce noise levels by at least 20 dBA. Furthermore, the steam blow activity will only be conducted during normal daytime work hours. A public notification program which will alert area residents to the nature of the activity, expected sound levels and to the fact that it is a one-time operation and not a part of normal plant operations will be implemented. Staff concurs that these would constitute acceptable mitigation measures.

OPERATION NOISE IMPACTS

During its operating life, the project will represent essentially a steady, continuous noise source day and night. Occasional short-term increases in noise level will occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels will decrease.

The applicant modeled facility noise emissions using predictive software. Noise modeling was conducted to predict the environmental noise emissions during normal, steady state conditions. The model simulates the outdoor propagation of sound from each point source and accounts for divergence, atmospheric sound absorption and sound attenuation. All equipment sound levels were based on standard manufacturer performance data or empirical formulae as outlined in the Electric Power Plant Environmental Noise Guide by Edison Electric Institute (1984).

The primary noise sources anticipated from the proposed facility include the heat recovery steam generators, the combustion turbine generator packages, the steam turbine generators, the cooling towers, the boiler feed pumps, the generator step-up transformers, and the circulating water pumps. Secondary noise sources are anticipated to include pumps, ventilation fans and compressors. The noise emitted by power plants during normal operations is generally broadband, steady state in nature.

The overall environmental noise emissions resulting from the facility during normal operation, with standard packaged equipment are depicted on Figure 5.12-2 (LPGP 1998a, AFC page 5.12-11).

LINEAR FACILITIES

The linear facilities, once placed in operation, will likely produce no audible noise. Project-related maintenance activities for the water pipeline could contribute briefly to the local noise environment; the effects, however, on the long-term acoustical environment will be minimal and insignificant. The electric transmission line will

normally be inaudible from any distance beyond 100 feet from the wire bundle (LPGP 1998a, AFC page 5.12-16). A humming from corona effect would occur in rainy or highly humid conditions, but would be practically unnoticeable, masked by traffic sounds and other ambient noises.

CUMULATIVE IMPACTS

Requisites to the discussions of cumulative impacts are nearby projects existing or planned. The LPGP will not adversely impact or be adversely impacted by the noise from any adjacent future development, as no such development is foreseen. Since the LPGP's noise emissions will be controlled to low levels in order to comply with LORS, they will likely be nearly unnoticeable.

COMMUNITY NOISE IMPACTS

The applicant commits to incorporating noise mitigation measures into the design of the project that will ensure that noise levels at the nearest receptor, the residences within McKittrick, will be below 40 dBA (LPGP 1998a, AFC § 5.12.2.1). This remains valid in light of the addition of the fuel gas compressor (LPGP 1998g). Since 40 dBA is such a low noise level, and in fact is quieter than the ambient noises typically encountered in the neighborhood of the project, staff agrees that this is a feasible approach to assuring project noise impacts do not exceed legal limits, and will likely not present a significant adverse impact upon sensitive receptors.

TONAL AND INTERMITTENT NOISES

One possible source of noise annoyance would be strong tonal noises, individual sounds that, while not louder than the permissible levels, stand out in sound quality. To ensure the avoidance of such tonal sound, the noise control design of the LPGP can be balanced to bring as many noise sources as possible to the same relative sound level, causing them all to blend without any one source standing out. Another potentially annoying source of noise from a combined cycle power plant is the intermittent or occasional actuation of steam relief valves. The hissing noise from these valves can be largely mitigated by the installation of adequate mufflers. To ensure that adequate measures are taken to mitigate tonal and intermittent noise sources, staff has proposed measures (see proposed Condition of Certification **NOISE-6**, below) to ensure that tonal and intermittent steam relief noises are not allowed to cause a problem.

WORKER NOISE EXPOSURE

The applicant has identified those locations in the plant and those pieces of equipment likely to produce hazardous noise levels (LPGP 1998a, AFC page 5.12-13), and has committed to complying with all applicable noise protection laws, regulations and requirements (LPGP 1998a, AFC page 5.12-18). Administrative procedures and hearing protection measures will be put in place to ensure workers' hearing is adequately protected. Staff has proposed measures (see proposed Condition of Certification **NOISE-7**, below) to ensure compliance.

Compliance with OSHA noise exposure regulations could be achieved through selection of quiet equipment when available, monitoring to determine areas with high noise levels, marking of identified high noise level areas with signs and yellow painted stripes on the floor, implementation of a hearing conservation program for all employees that are likely to be exposed to noise levels exceeding 85 dBA over an 8-hour work day, provision of hearing protection devices and training on their use, and a requirement to wear hearing protection in designated high noise level areas.

MITIGATION MEASURES

The potential noise mitigation measures described by the applicant (LPGP 1998a, AFC page 5.12-8) are typical for such an application. They include (to be employed as required):

1. provide standard outdoor/weather enclosures for the combustion turbine generator packages;
2. provide air inlet silencers for the combustion turbines;
3. provide standard outdoor/weather enclosure for the steam turbine generator packages; and
4. install silencers for the heat recovery steam generator exhaust stacks.

These sorts of noise attenuation measures have been employed for years on similar facilities, and their noise control abilities are well known. Staff has proposed measures (see proposed Condition of Certification **NOISE-6** below) to ensure that these noise mitigation measures are carried out, and that they are effective.

The only strong tonal frequency identified is from transformers. The highest tonal component level is estimated at 37 dB. Adding a 5-dB penalty to the overall 37-dB level yields a "weighted" level of only 42 dB. This is less than significant sound for any noise sensitive use. To ensure this, staff has proposed measures (see proposed Condition of Certification **NOISE-6**, below) to ensure that tonal noises are not allowed to cause a problem.

FACILITY CLOSURE

Upon closure of the facility, all operational noise will cease; no further adverse impacts from operation will be possible. The remaining potential noise source will be that caused by dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise will be similar to that caused by the original construction of the LPGP, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the LPGP will likely be built and operated to comply with all applicable noise laws, ordinances, regulations and standards. Staff further concludes that the LPGP will likely present no significant adverse noise impacts. The LPGP will likely represent an unobtrusive, nearly undetectable addition to existing noise levels.

RECOMMENDATIONS

Staff recommends the following:

The applicant shall conduct two (2) occupational noise surveys, one during plant construction and the second during plant operation. The operational noise survey shall be conducted only after the facility has achieved at least 80% of the plant rated output capacity, but no later than 30 days after the plant reaches 80% of its rated capacity. Both surveys should attempt to verify that workers are not exposed to noise intensities exceeding those identified by Cal OSHA.

If such exposures are found to occur, the applicant shall implement, at a minimum, the following:

1. Place signs in conspicuous locations clearly warning employees that: (a) specified areas are in excess of the Cal OSHA noise standards; and (b) access to such areas shall be limited only to workers that are using proper hearing protective devices.
2. Train personnel in the proper use of individual hearing protective devices, the training to be provided by a person familiar with the use and care of such devices.
3. As needed, employ engineering and administrative controls to reduce employee exposure to noise.
4. Employ an acoustical specialist to participate in the design, procurement and installation phases of the LPGP in order to assure that the LPGP will comply with Cal-OSHA.
5. Conduct an ambient noise survey to confirm that the operational noise levels of the LPGP are within the estimated levels as provided in the application for all the sensitive receptors, and to verify that no new pure-tone components are introduced.
6. Employ the noise complaint resolution procedure that has been filed as part of the application in order to document all the noise complaints.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of rough grading, the project owner shall notify all residents within McKittrick, by mail or other effective means, of the commencement of LPGP construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the LPGP. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the LPGP site during construction in a manner visible to passersby. This telephone number shall be maintained until the LPGP has been operational for at least one year.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report following the start of rough grading a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

NOISE-2 Throughout the construction and operation of the LPGP, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner or authorized agent shall:

1. use the Noise Complaint Resolution Form (see below for example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
2. attempt to contact the person(s) making the noise complaint within 24 hours;
3. conduct an investigation to determine the source of noise related to the complaint;
4. if the noise is project related, take all feasible measures to reduce the noise at its source; and
5. submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to complainant's satisfaction.

Verification: Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with Kern County and with the CPM documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an

updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE COMPLAINT RESOLUTION FORM

La Paloma Generating Project
(98-AFC-2)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____
Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at 3 feet: _____dBA Date: _____
Initial noise levels at complainant's property: _____dBA Date: _____

Final noise levels at 3 feet: _____dBA Date: _____
Final noise levels at complainant's property: _____dBA Date: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

Approximate installed cost of corrective measures: $ _____
Date installation completed: _____
Date first letter sent to complainant: _____ (copy attached)
Date final letter sent to complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required.

NOISE-3 Prior to the start of LPGP construction, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA standards.

Verification: At least 30 days prior to the start of rough grading, the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon request.

NOISE-4 If a traditional, high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 100 dBA measured at a distance of 100 feet. The project owner shall conduct steam blows only during the hours of 7:00 a.m. to 7:00 p.m. weekdays, and 8:00 a.m. to 6:00 p.m. weekends and holidays. If a modern, low-pressure continuous steam blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM.

Verification: At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer, and a description of the steam blow schedule. At least 15 days prior to the first low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the expected time schedule for execution of the process.

NOISE-5 The project owner shall conduct a public notification program to alert residents within one mile of the site and the residents of McKittrick prior to the start of steam blow activities. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: At least 15 days prior to the first steam blow(s), the project owner shall notify all residents within one mile of the site and all residents of McKittrick of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. Within five (5) days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE-6 Upon the LPGP first achieving an output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same monitoring sites employed in the pre-project

ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. No single piece of equipment shall be allowed to stand out as a dominant source of noise that draws complaints. Steam relief valves shall be adequately muffled to preclude noise that draws complaints. If the results from the survey indicate that operation of the power plant causes noise levels in excess of 40 dBA (L_{eq}) measured at the nearest residence, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

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

NOISE-7 The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within thirty (30) days after the facility is operating at an output of 80% of rated capacity or greater, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095-5100 (Article 105) and Title 29, Code of Federal Regulations, Part 1910. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA upon request.

NOISE-8 In order to comply with the community noise equivalent level (CNEL), noisy construction work shall be restricted to the hours of: 7 a.m. to 7 p.m. on weekdays and from 8 a.m. to 6 p.m. on weekends and holidays.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

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U.S. EPA, 1971, Noise from Construction Equipment and Operations. Prepared by Bolt et. al. Beranek, and Newman, Boston, MA.

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NOISE: APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

Noise levels can be measured in a number of ways. One common measurement, the equivalent sound level (L_{eq}), is the long-term A-weighted sound level that is equal to the level of a steady-state condition having the same energy as the time-varying noise, for a given situation and time period. (See NOISE: Table A1, below.) A day-night (L_{dn}) sound level measurement is similar to L_{eq}, but has a 10 dB weighting added to the night portion of the noise because noise during night time hours is considered more annoying than the same noise during the day.

NOISE Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} is generally taken as the background noise level.
Equivalent Noise Level L_{eq}	The average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels to levels in the evening from 7 p.m. to 10 p.m. and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L_{dn}	The Average A-Weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: California Department of Health Services 1976.

In order to help the reader understand the concept of noise in decibels (dBA), NOISE: Table A2 has been provided to illustrate common noises and their associated dBA levels.

NOISE Table A2
Typical Environmental and Industry Sound Levels

Source and Given Distance from that Source	A-Weighted Sound Level in Decibels (dBA)	Environmental Noise	Subjectivity/ Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		
	110	Rock Music Concert	Very Loud
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')			
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	Quiet
Large Transformer (200')	40		
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
	0		

Source: Peterson and Gross 1974

SUBJECTIVE RESPONSE TO NOISE

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships (Kryter 1970) can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.
2. Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.
3. A change in level of at least five dB is required before any noticeable change in community response would be expected.
4. A 10-dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

COMBINATION OF SOUND LEVELS

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

NOISE Table A3
Addition of Decibel Values

When two decibel Values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to ± 1 dB.	

Source: Thumann, Table 2.3

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

NOISE Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: OSHA Regulations

VISUAL RESOURCES

Testimony of David Flores

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. Visual quality is the value of visual resources. Scenic resources are visual resources that contribute positively to visual quality.

This analysis focuses on whether the La Paloma Generating Project (LPGP) will cause significant adverse visual impacts and whether the project will conform with applicable laws, ordinances, regulations and standards (LORS). The determination of the potential for significant impacts to visual resources resulting from the proposed project is required by the California Environmental Quality Act (CEQA) and the Energy Commission's power plant siting regulations, Title 20, California Code of Regulations, section 1701 et seq. The determination of the conformance of the proposed project with applicable LORS is required by Public Resources Code, section 25525.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL AND STATE

Segments of the proposed transmission line rights-of-way are located on both federal and state lands. The Bureau of Land Management (BLM) manages the federal lands, and the California Department of Fish and Game (CDFG) manages the state. See the **Biological Resources, Land Use, Paleontological Resources** and **Cultural Resources** sections of this Final Staff Analysis (FSA) for further discussion. No roadway in the project vicinity is a designated or eligible State Scenic Highway. Therefore, no federal or state regulations pertaining to scenic resources are applicable to the project.

LOCAL

COUNTY OF KERN

GENERAL PLAN

Kern County has no specific policies on visual or aesthetic resources that apply to the La Paloma project. However, these issues are addressed in the Kern County General Plan, Open Space Element, and are implemented by the Kern County Planning and Development Services Department (Kern County, 1994). This element of the General Plan requires public notification and review of any projects that may adversely impact visual resources. The La Paloma project is generally consistent with the land use designation for the area, and therefore is considered consistent with associated visual resource planning purposes and General Plan requirements.

PROJECT DESCRIPTION

The LPGP consists of a nominal 1,048 megawatt (MW) natural gas-fired power plant, a 230 kilovolt (kV) switchyard, a 230 kV transmission line, a natural gas supply pipeline, a raw (cooling) water pipeline and a 700,000 gallon water storage tank.

The power generated at the facility will be transmitted over a double circuit 230 kV transmission line running from the plant site approximately 14.2 miles to the Midway Substation near Buttonwillow. Towers will be single shaft tubular steel structures (LPGP 1998, p.5.13-7). Each structure will be approximately 118 to 143 feet tall, depending on span requirements.

NATURAL GAS AND WATER SUPPLY PIPELINE

The raw water supply and natural gas supply pipelines will be underground. Construction of the raw water supply pipeline will be completed within six months, and the natural gas supply pipeline within two months.

WATER STORAGE TANK

On December 7, 1998, the La Paloma Generating Company, LLC (La Paloma) submitted a project revision that includes a 700,000-gallon welded steel reservoir tank (VISUAL RESOURCES Figure 3). The tank will be approximately 74 feet in diameter and 24 feet tall, and will be situated on a cut pad varying from 4 to 12 feet below the existing grade on the side of a knoll approximately 1,026 feet above grade. The area to be disturbed by the construction of the tank will be 0.52 acres, including the pad, an access road to the southeast of the tank, and the pipeline turnout.

COMMUNICATION TOWER

The communication tower was also submitted as part of the revised application on December 7, 1998. It will likely be located next to the storage reservoir. The tower would be nearly the same height as the tank and either be a single pole or a triangular structure. The three reflectors would be only 18 inches in diameter and could not be discerned at a viewing distance of 4,575 feet.

ADDITIONAL REVISIONS

The December 7, 1998 revision also addressed the addition of a natural gas compressor, revisions to the water supply turnout, route modification to the water supply pipeline Route 2. According to La Paloma, additional visual quality impacts are anticipated from these revisions as stated.

On March 5, 1999, the La Paloma Generating Company submitted a revision dropping further consideration of the two alternate linear routes (La Paloma Generating Project, 1998. Application for Certification, addendum VIII). These include the alternate transmission line, Route 1A, and the alternate water supply line, Route 3. Staff has revised the Visual Resources section, excluding further discussion of these routes.

POWER PLANT

VISUAL RESOURCES Figures 1 and 2 provides an artist's rendering and cross-section of the power plant. The most visually prominent elements of the power plant will be within the four power islands, particularly the four heat recovery steam generators (HRSG) which are 65 feet high, and the four stacks which are 100 feet high. The facilities in the rest of the power train are generally less than 30 feet high. The other plant facilities include the water treatment facilities, two cooling towers, storage tanks, switchyard, buildings and parking areas. The yard tanks will be vertical, cylindrical, and steel, and will vary from 12 to 30 feet high. The switchyard and control building will be 14 feet high. Five of the six plant buildings will be 12 feet tall and single story; the control/electrical building will be 20 feet high.

TRANSMISSION LINE

The power generated at the facility will be transmitted over a double circuit 230 kV transmission line running from the plant site approximately 14.2 miles to the Midway Substation near Buttonwillow. Towers would be single shaft tubular steel structures (LPGP 1998a, p.5.13-7). Each tower would be approximately 118 to 143 feet tall, depending on span requirements.

SETTING

REGIONAL SETTING

The LPGP site is located within the southeastern end of McKittrick Valley in the southern end of the San Joaquin Valley. It is an area bordered by the low foothills of the Temblor Range to the southwest and the Elk Hills to the north and northeast. The valley slopes gently to the northeast and has a generally flat appearance. Vegetation is low growing and sparse, consisting of open grasslands, patches of saltbush scrub, and a dense growth of alkali sink scrub. Streams in the region are ephemeral, running only during periods of rainfall. The nearest body of water is Buena Vista Lake, 11.5 miles northeast of Taft and 26 miles from the plant site. Overall, the features of vegetation and landforms offer little diversity, interest, or contrast.

Although there has been a continued history of oil development activities in the valley and along Elk Hills, evidence of development is limited throughout much of the valley. Scattered tanks and oil well pumps are visible, particularly at the southeast end of the valley, but much of the valley appears predominantly natural.

PROJECT AREA SETTING

The project site will be located on approximately 23 acres of land and is within an existing oil and gas production field operated by Chevron. There are various oil production wells scattered around the project site with existing vegetation low growing and sparse, consisting of open grasslands and patches of saltbrush scrub. The Elk Hills are located to north of the project site and an existing transmission line (Midway-Sunset) is located approximately one mile east of the project site.

VISUAL RESOURCES Figure 1
Artist's Rendering of Proposed LPGP

VISUAL RESOURCES Figure 2
Cross Section of Major Facilities at the LPGP

VISUAL RESOURCES Figure 3
Site Plan of Storage Reservoir Site

VIEWSHED

POWER PLANT SITE

The sensitive receptor closest to the power plant is a single residence to the east of McKittrick located approximately 1.5 miles northwest of the plant site and about 150 feet north of Reserve Road. This residence is in the midst of oil production facilities owned by Berry Petroleum Co. and Anchor Refining Co., Inc. From urban residential areas (those within cities or towns), on the other hand, views are considered highly sensitive. The residential area nearest to the power plant is the community of McKittrick, its eastern edge being about 1.7 miles away from the plant site. Figure 4 (b) is a view from the residence in McKittrick that is closest to the power plant, located on 4th Street; designated as Key Observation Point 2.

The plant facilities would be visible in the distance. There are four homes on 4th Street that face east toward the power plant site.

Reserve Road is a county maintained road paved for 3.7 miles from its intersection with State Highways 58 and 33 and is unimproved thereafter. The public uses Reserve Road to access homes within McKittrick and may use it to travel east of McKittrick. However, east of town the road serves solely as access to oil production facilities; there are no residences or other indicators of moderate to high sensitivity along it. Accordingly, sensitivity for the part of Reserve Road east of town is considered to be low.

State Highway 33 and 58 serve as the primary access to McKittrick and views from the highways in the vicinity of town are considered highly sensitive. However, homes and landscaping within the part of the community east of the highway block views of the plant site, therefore sensitivity is considered low.

ELECTRICAL TRANSMISSION LINE

The power generated at the facility will be transmitted over a double circuit 230 kV transmission line running from the plant site approximately 13.6 miles to the Midway Substation near Buttonwillow. Towers would be single shaft tubular steel structures (LPGP 1998, p.5.13-7). Each structure would be approximately 118 to 143 feet tall, depending on span requirements. The towers would be visible from all of the view areas described for the project site.

SCENIC FEATURES AND VIEW CORRIDORS

There are no designated scenic highways, roads, or corridors in the project vicinity.

SENSITIVE RECEPTORS

Potentially sensitive receptors include residences along neighboring roads and travelers on those roads.

KEY OBSERVATION POINTS

Visual resource effects on each group of sensitive receptors were evaluated from representative Key Observation Points (KOPs) (see VISUAL RESOURCES Table 1 and VISUAL RESOURCES Figure 4). Views from KOPs are shown both before project construction and with the project simulated in the view, at the end of this visual resources section. Figures showing the existing setting and the proposed project from each KOP are grouped at the end of the analysis.

VISUAL RESOURCES Table 1
Key Observation Points

KOP Number	Description
1	Taken from project site - east of McKittrick located near Reserve Road.
2	Taken from near residence on 4th Street approximately 1.7 miles west of the power plant.
3[a]	Taken from near residence at the corner of Buerkle and Mirasol Avenue looking north at proposed transmission line.

[a] Originally KOP 5; with the elimination of alternate Transmission Route 1A, the KOP has been redirected from a southerly to northerly observation point.

KEY OBSERVATION POINT 1: RESERVE ROAD

Key Observation Point 1 is located at the proposed power plant site. (see VISUAL RESOURCES Figure 5).

VISUAL QUALITY

From Key Observation Point 1 the view from the project site is dominated by the existing natural vegetation of the area which mainly consists of low brush and natural grasses. (see VISUAL RESOURCES Figure 6). Shown in the foreground are the existing oil production facilities to the far left of the view.

The view of the Elk Hills and natural terrain features is of moderate to high quality. The overall visual quality is moderate.

VIEWER SENSITIVITY

Because Key Observation Point 1 represents primarily oil field workers, viewer sensitivity is considered low.

VISIBILITY

Because the view of the proposed project site is largely unobstructed, visibility from Key Observation Point 1 is high.

VIEWER EXPOSURE

Distance

This view area would be from the traveling public at Reserve Road and Skyline Road. The project would be in the foreground, about 350 feet from KOP1.

Number of Viewers

View area will be limited due to its setting, and limited traffic to the area. Average daily traffic on Reserve Road is estimated at 220 vehicles per day (AFC Table 5.11-2).

Duration of View

Because the view area represents the travelers on Reserve and Skyline Road, duration of view is moderate.

Overall Viewer Exposure

Considering the foreground distance, the small number of viewers, and the moderate duration of view, viewer exposure is moderate for Key Observation Point 1.

KEY OBSERVATION POINT 2: RESIDENCES AT THE EAST END OF MCKITTRICK ROAD

Key Observation Point 2 is located on 4th Street and Reserve Road, near residences west of the proposed project site (see VISUAL RESOURCES Figure 6).

VISUAL QUALITY

The view toward the project site is panoramic across the McKittrick Valley (see VISUAL RESOURCES Figure 6). However, the view includes electric transmission lines on wooden poles and oil development areas, so visual quality is low to moderate.

VIEWER SENSITIVITY

Because Key Observation Point 2 represents residences, viewer sensitivity is considered high.

VISIBILITY

Because views toward the project site and transmission lines are largely unobstructed, visibility from Key Observation Point 2 is high.

VIEWER EXPOSURE

Distance

This view area is within 1.7 miles of the project site, and 0.7 miles of the transmission line.

NUMBER OF VIEWERS

This view area contains four residences (LPGP 1998a, Figure 6). Data on the number of daily travelers on 4th Street is not available.

Duration of View

Because the view area is in a residential neighborhood, duration of view is long.

Overall Viewer Exposure

Considering the mid-range distance, the small number of viewers, and the long duration of view, viewer exposure is moderate for Key Observation Point 2.

KEY OBSERVATION POINT 3 (FORMERLY KOP 5): RESIDENCES AT BUERKLE ROAD AND MIRASOL AVENUE

Key Observation Point 3 is located near the intersection of Buerkle Road and Mirasol Avenue, and represents three residences in the area (No visual simulation is available as staff has redirected this KOP to the north, because Route 1A has been eliminated).

VISUAL QUALITY

The view from Key Observation Point 3 toward the proposed transmission line includes agricultural uses and existing transmission lines in the foreground and an existing farming residence with trees in the foreground (see VISUAL RESOURCES Figure 9). Considering all of these factors, visual quality for KOP 3 is low to moderate.

VIEWER SENSITIVITY

Because of the residences in the area of Key Observation Point 3, viewer sensitivity is high.

VISIBILITY

Some views of the transmission line would be partially obscured by the existing Diablo-Midway transmission line. Therefore visibility for KOP 3 is moderate.

VIEWER EXPOSURE

Distance

The proposed transmission line would be within foreground views for residences in the area of Key Observation Point 3.

Number of Viewers

Three residences are in the area of Key Observation Point 3.

Duration of View

Because residences are present, duration of view is long.

Overall Viewer Exposure

Considering the foreground distance, the small number of viewers, and the long duration of view, viewer exposure is moderate for Key Observation Point 3.

PROJECT SPECIFIC IMPACTS

OPERATION IMPACTS

As discussed in the section on methodology (see Visual Resources Appendix B), Commission staff considers the susceptibility to visual impact and the severity of impact together to determine the significance of impact for most factors. Both of these values are considered in regard to each of the view areas, represented by key observation points. Lighting and visible plume impacts as well as construction impacts are addressed separately.

PROJECT SITE AND TRANSMISSION LINE

VISUAL RESOURCES Table 2 shows the values for visual quality, viewer sensitivity, visibility, and viewer exposure (discussed previously in the setting section) considered for each of the Key Observation Points analyzed in that section and the resultant value for visual impact susceptibility for each Key Observation Point.

VISUAL RESOURCES Table 3 shows the values for form, line, color, texture, and scale contrast; scale dominance; spatial dominance; view blockage considered for each of the Key Observation Points analyzed, and the resultant value for impact severity for each Key Observation Point.

VISUAL RESOURCES Table 4 shows the values for visual impact susceptibility and visual impact severity for each Key Observation Point and the resultant values for visual impacts.

Key Observation Point 1

Taken from the project site: east of McKittrick located near Reserve Road.

Visual Impact Susceptibility

For Key Observation Point 1, visual impact susceptibility is low (see VISUAL RESOURCES Table 2).

Visual Impact Severity

VISUAL RESOURCES Figure 6 shows the appearance of the power plant from Key Observation Point 1.

Contrast with Structures

The project structures would cause a low level of contrast in regard to form, line, color and texture with the existing oil tanks and storage buildings to the east of the project site. Because the proposed exhaust stacks would appear somewhat larger than the existing structures, the project would cause moderate scale contrast.

VISUAL RESOURCES Table 2
Visual Impact Susceptibility - Key Observation Points
Route 1

	VISUAL QUALITY	VIEWER SENSITIVITY	VISIBILITY	VIEWER EXPOSURE	VISUAL IMPACT SUSCEPTIBILITY
Key Observation Point 1	Moderate	Low	High	Moderate	Low
Key Observation Point 2	Low to Moderate	High	High	Moderate	Moderate
Key Observation Point 3[a]	Low to Moderate	High	Moderate	Moderate	Moderate

[a] Originally KOP 5; with the elimination of alternate Transmission Route 1A, the KOP has been redirected from a southerly to northerly observation point.

Contrast with Vegetation

Vegetation visible in the view from Key Observation Point 1 toward the site consists of a variety of seasonal grasses in the direct foreground and low shrubs. The project appears generally as a group of rectangles of varying proportions that would create a high level of contrast in regard to form and line with the irregular shapes of the grassy vegetation. The proposed earth tone colors of the project would create a low level of contrast with the seasonally green or tan tones of the vegetation in this view. The contrast between the flat surfaces of project elements and the varied texture of existing vegetation would cause a high level of contrast in regard to texture. Because the vegetation is closer to the KOP than the proposed structures would be, the sparse vegetation would appear larger than the project structures, so scale contrast would be low.

In summary, if no existing structures were visible, contrast with vegetation would be high in regard to form, line and texture, and low in regard to color and scale. However, because the existing oil production facilities are visible from Key Observation Point 1, and those structures are similar to the proposed project structures in regards to form, line, texture, and scale, the increments of contrast with vegetation would be small, so contrast with vegetation would be low.

VISUAL RESOURCES Table 3
Visual Impact Severity - Key Observation Points

	CONTRAST					DOMINANCE		VIEW	VISUAL IMPACT SEVERITY
	FORM	LINE	COLOR	TEXTURE	SCALE	SCALE	SPATIAL	BLOCKAGE	
Key Observation Point 1	Structures: L* Vegetation: L Land: L	Structures: L Vegetation: L Land: H	Structures: L Vegetation: L Land: L	Structures: L Vegetation: L Land: L	Structures: M Vegetation: L Land: L	***Dominant***	Co-dominant	Weak	Strong
Key Observation Point 2	Structures:L Vegetation: L Land: L	Structures: L Vegetation: L Land: L	Structures: M Vegetation: L Land: L	Structures: L Vegetation: L Land: L	Structures: L Vegetation: L Land: L	*Sub-ordinate*	Sub-ordinate	Weak	Moderate
Key Observation Point 3[a]	Structures: L Vegetation: ***L*** Land: ***L***	Structures: L Vegetation: ***L*** Land: ***L***	Structures: L Vegetation: L Land: L	Structures: L Vegetation: L Land: L	Structures: L Vegetation: L Land: L	***Co-Dominant***	Co-dominant	Weak	Strong

[a] Originally KOP 5; With the elimination of alternate Transmission Route 1A, KOP has been redirected from a southerly to a northerly observation point.
L = Low; M = Moderate; H = High

Factors shown in bold italic type contributed to visual severity ratings of strong or very strong

Table B-1 in Appendix B shows the contribution to visual impact severity for each level of each factor.

VISUAL RESOURCES Table 4-Route 1
Visual Impacts - Key Observation Points

	VISUAL IMPACT SUSCEPTIBILITY	VISUAL IMPACT SEVERITY	VISUAL IMPACT
Key Observation Point 1	Low	Strong	Insignificant
Key Observation Point 2	Moderate	Moderate	Less than significant
Key Observation Point 3	Moderate	Strong	Less than significant

Contrast with Land/Water

No water is visible in this view. The landform appears generally flat, with the Elk Hills in the foreground, so the rectangular shapes and straight lines of the project structures would cause a high level of contrast in regard to form and line. Sparse vegetated land is visible, so the project would not cause contrast with land in regard to color or texture. The project would appear similar in size to the Elk Hills and the existing oil facilities in the foreground, so scale contrast would be low. In summary, if no existing structures were visible from Key Observation Point 1, contrast with land would be high in regard to form and line, low in regard to scale and nonexistent in regard to color and texture. However, because the existing oil facilities are visible from Key Observation Point 1, contrast with land added by the proposed structures would be small, and contrast with land would be low.

Scale Dominance

The project would appear of large size in comparison to the wide field of view, and would occupy a large part of the setting. Therefore, scale dominance from Key Observation Point 1 would be dominant.

Spatial Dominance

Because the spatial composition of the view from Key Observation Point 1 is panoramic, the project would be subordinate in regard to composition. Because the project site is in the central portion of the view, spatial dominance would be dominant in regard to position. Because the project will be backdropped by the Elk Hills, spatial dominance in regard to backdrop would be subordinate. The overall spatial dominance rating would be co-dominant.

View Blockage

From Key Observation Point 1 the project will block a substantial portion of the view that can now be seen. Because visual quality is low to moderate, the severity of view blockage would be weak (see VISUAL RESOURCES Table B-1).

Visual Impact Severity

Because scale dominance would be dominant, the project's visual impact severity from Key Observation Point 1 would be strong (see VISUAL RESOURCES Tables 3 and B-1).

Visual Impact

Because visual impact susceptibility for Key Observation Point 1 is low and visual impact severity would be strong, visual impact would be insignificant (see VISUAL RESOURCES Tables 4 and B-2).

Key Observation Point 2: Residences on 4th Street

Visual Impact Susceptibility

For Key Observation Point 2 visual impact susceptibility is moderate (see VISUAL RESOURCES Table 2).

Visual Impact Severity

VISUAL RESOURCES Figure 6 shows the appearance of the project from Key Observation Point 2 (representing residences on 4th Street).

Contrast with Structures

The largest structures visible from the area represented by Observation Point 2 are the existing oil facilities, which consist of various oil pumps and the black and bright white colored tanks. Other structures include wooden electrical poles. The proposed plant would contrast moderately with the surrounding area in regard to color (beige and gray) form, line, texture, and scale. The proposed transmission line poles would appear similar to the existing poles visible along Reserve Road in regard to form, line, and texture, so contrast with the existing poles would be low in regard to these factors.

The proposed poles would appear smaller than the existing poles from this view, so scale contrast would be low.

Contrast with Vegetation

Vegetation visible in the view from Key Observation Point 2 toward the site consists of grasses, shrubs, and mature trees near residences. The project would appear as a group of rectangles, with small vertical elements created by the transmission poles. The grass and shrubs in the view appear as irregular masses, and the mature trees appear as rounded masses.

As a whole, the project would contrast strongly in form and line with vegetation. The proposed earth tone colors of the project would cause low contrast with the seasonally green or green and tan colors of the vegetation in this view. The flat surfaces of project elements would not be discernible from this view distance, so the contrast with vegetation would be low in regard to texture. Because the project would appear similar in size to some of the existing vegetation due to its distance from the key observation point, scale contrast would be low. In summary, if no existing structures were visible from Key Observation Point 2, contrast with vegetation would be strong in regard to form and line, and low in regard to color, texture, and scale. However, because the existing oil production facilities are visible from Key Observation Point 2, and those structures are similar to the proposed power plant in regard to form and line, the increment of contrast with vegetation added by the proposed structure would be small, so contrast with vegetation would be low.

Contrast with Land/Water

No water is visible in this view. The landform in the foreground and middle ground is generally flat. The project would appear as a group of rectangles, with small vertical elements created by the transmission poles. As a whole, contrast in regard to form and line would be moderate. The proposed earth tones of the project would create low contrast with the earth tones of the land visible from this Key Observation Point. The flat surfaces of project elements would not be discernible from this view distance, so the contrast with land would be low in regard to texture. The project would appear smaller than major land elements in the view, so scale contrast would be low. In summary, if no existing structures were visible from Key Observation Point 2, contrast with land would be moderate in regard to form and line, and low in regard to color, texture, and scale. However, because the existing oil production facilities will be visible near the proposed plant, the increment of contrast with land that the proposed project would cause would be small, so contrast with land would be low.

Scale Dominance

The project would appear small to moderate in comparison to the wide field of view, and would occupy a small part of the setting. Therefore, scale dominance from Key Observation Point 2 would be subordinate.

Spatial Dominance

Because the spatial composition of the view from Key Observation Point 2 is panoramic, the project would be subordinate in regard to composition. Spatial

dominance would be subordinate in regard to position. Because the transmission poles would be backdropped by the sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be subordinate.

View Blockage

From Key Observation Point 2, the project would block the view of a small part of the background mountains that can now be seen. However, the existing oil production facilities block a similar amount of background mountains, so the visual quality of the view is moderate rather than high. The blockage of a minor portion of this moderate quality view would constitute weak view blockage.

Visual Impact Severity

Because a) the highest contrast rating would be moderate for color, b) scale dominance would be subordinate, c) spatial dominance would be subordinate, and d) the severity of view blockage would be weak, the project's visual impact severity from Key Observation Point 2 would be moderate (see VISUAL RESOURCES Table B-1).

Visual Impact

Because for Key Observation Point 2 visual impact susceptibility is moderate and visual impact severity would be moderate, visual impact would be less than significant (see VISUAL RESOURCES Tables 4 and B-2).

Key Observation Point 3 (Formerly KOP 5) : Residences at the corner of Buerkle Road and Mirasol Avenue

Visual Impact Susceptibility

For Key Observation Point 5 visual impact susceptibility is moderate (see VISUAL RESOURCES Table 4).

Visual Impact Severity

VISUAL RESOURCES Figure 7 shows the appearance of the project from Key Observation Point 3.

Contrast with Structures

From Key Observation Point 3 the most prominent existing structures are the poles of the Diablo-Midway electrical transmission line approximately 3,000 feet northwest from this viewpoint. (see VISUAL RESOURCES Figure 7). The proposed transmission line would include poles that would appear slightly shorter than the existing lines. The form and line of the proposed poles would be similar to the existing poles. The poles also would be of galvanized steel and similar in color and texture with the existing transmission lines. In summary, the proposed poles would cause low contrast in regard to form, line, color, texture, and scale.

Contrast with Vegetation

Vegetation visible in the view from Key Observation Point 3 toward the site consists of irrigated row crop and a few trees. The vertical form of the poles would contrast highly

to the low, irregular form of the agricultural setting and the rounded form of the trees. The straight lines of the poles would similarly contrast highly with the existing vegetation. The color tones of the poles would contrast moderately with the variety of green tones of the vegetation. The texture of the poles would contrast moderately with the texture of the vegetation. The towers would be substantially larger than any of the vegetation, so scale contrast would be high. However, the proposed line would only add incrementally to the contrast with vegetation caused by the existing poles, which are closer to the residences, so contrast with vegetation would be low.

Contrast with Land/Water

No water is visible in this view. The landform consists of flat cropland with the Elk Hills visible to the on the horizon. The proposed transmission poles would contrast highly with this land surface in regard to form and line. The grey tone color of the line would cause moderate contrast with the agricultural land visible from this viewpoint. The flat texture of the poles would cause moderate contrast with the rougher texture of the land. No landforms appear large from this view, so the poles would create a high level of scale contrast. In summary, if no existing structures were visible, contrast with land would be high in regard to form, line, and scale, and moderate in regard to color and texture. However, the linear facilities would only add incrementally to the contrast with land caused by the existing Midway-Sunset transmission line, which is closer to the residences, so contrast with land would be low.

Scale Dominance

The group of proposed transmission poles visible from this viewpoint would be moderate in size compared to the panoramic field of view and would occupy a moderate part of the setting. Therefore, scale dominance from Key Observation Point 3 would be co-dominant.

Spatial Dominance

Because the spatial composition of the view from Key Observation Point 3 is panoramic, the towers would be subordinate in regard to composition. Spatial dominance would not be prominent in regard to position. Because the transmission poles would be almost completely backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant, similar to the existing poles.

View Blockage

From Key Observation Point 3 with the panoramic view due to the agricultural setting, the proposed linear facilities will not block the view of the Elk Hills, so the proposed poles along would only block a small portion of the field of vision. Therefore, the severity of view blockage would be weak.

Visual Impact Severity

Because scale dominance would be co-dominant, the project's visual impact severity from Key Observation Point 3 would be strong (see VISUAL RESOURCES Tables 3 and B-1).

Visual Impact

Because visual impact susceptibility for Key Observation Point 3 is moderate and visual impact severity would be strong, visual impact would be less than significant (see VISUAL RESOURCES Tables 4 and B-2).

Lighting

The proposed project has the potential to substantially increase the amount of light visible to the surrounding area. The applicant has proposed measures to reduce lighting impacts, and staff has expanded on these measures (see below).

Natural Gas Supply Pipeline

Because the natural gas supply pipeline would be buried and not be visible after construction is completed, it would not cause significant visual impacts.

Visible Plumes

Plume Characteristics

The potential exists for white vapor plumes (water vapor condensation from the exhaust) to be visible from the project stacks and cooling tower. The frequency, persistence, and size of visible condensate plumes depends primarily on the design and type of combustion turbine generator, heat recovery steam generator, auxiliary boiler, and cooling tower, as well as meteorological conditions of temperature and humidity.

The plume of steam rising from the cooling towers could project upward as much as 1,000 feet from the ground under worst case conditions of temperature and atmospheric conditions.

Although condensate plumes usually tend to dissipate fairly quickly, because of the meteorological conditions in late November, December, and January, such a plume tends to linger and not dissipate as rapid. However, this is also the foggy season and such plumes will not be visible during much of the time. During the rest of the period when conditions are favorable for steam plume formation, the length of time under which plumes may occur is limited to short periods on any particular day.

Viewshed

The viewshed for the plume is substantially larger than that for the project structures because the plume's maximum height will be much greater than the height of the structures. The tallest proposed structures are the four stacks, proposed to be 100 feet tall. The maximum predicted height of the plume above the cooling towers is over 1,000 feet. The primary area of concern within the expanded viewshed is to the west, where rural residences, the community of McKittrick and highly traveled public roads such as State Highway 58 and 33 exist.

Visual Quality

The cooling tower plume's viewshed includes the McKittrick Valley and the surrounding hills. Portions of the natural landscape have been altered by oil production facilities, so visual quality is low to moderate.

Viewer Sensitivity

As previously discussed, residents are considered to have high visual sensitivity, so visual sensitivity for residents in McKittrick is high. Travelers on State Routes 33 and 58 vary in visual sensitivity. Those travelers commuting to and from work in the oil fields are considered to have low visual sensitivity. Other travelers on these highways are considered to have moderate visual sensitivity because the area is not known for its scenic value, so few recreational travelers use these highways.

Visibility

For the four residences in McKittrick with direct views of the plant site the visibility of the plume is high because views are unobstructed. For other residents in McKittrick on the east side of State Routes 33 and 58 existing homes and other buildings would screen the lower portion of the plume from view, so visibility is moderate. For residences on the west side of State Routes 33 and 58 views of the plumes would be generally blocked by existing buildings. The travel directions on State Routes 33 and 58 are generally perpendicular to the power plant site, so visibility is low to moderate for travelers.

Viewer Exposure

The factors determining viewer exposure are distance, the number of viewers and the duration of exposure. The nearest residences with views of the plume are approximately 1.5 miles from the project site and consist of approximately 55 individual viewers, based on approximately 22 residences south of Reserve Road and east of State Highway 33 and a factor of 2.5 persons per household (U.S. Census Bureau 1990). Therefore, the number of residential viewers is low to moderate. The number of travelers on State Routes 33 and 58 in this area is approximately 2,700 per day and 2,750 per day, respectively (LPGP 1998a, Table 5.11-1). Therefore, the number of traveling viewers is large. The duration of view is moderate due to the variable presence and size of the plume and due to the differences in activities between viewers. Although condensate plumes usually tend to dissipate fairly quickly, because of the meteorological conditions in late November, December, and January, such a plume tends to linger and not dissipate as rapidly. However, this is also the foggy season and such plumes will not be visible during much of the time. During the rest of the period when conditions are favorable for steam plume formation, the length of time under which plumes may occur is limited to short periods on any particular day. Considering these limitations, duration of view is moderate for residents. Maximum duration of view for travelers on State Routes 33 and 58 is between one and two minutes because of hills, and actual duration for these travelers is further restricted by the weather conditions previously discussed. Therefore, expected duration of view for travelers is short. In summary, for residents

the viewing distance is middle ground, the number of viewers is low to moderate, and the duration of view is moderate, so overall visual exposure for residents is low to moderate. For travelers on State Routes 33 and 58 the viewing distance is middle ground, the number of viewers is large, and the duration of view is very short, so overall visual exposure for these travelers is low to moderate.

Visual Impact Susceptibility

For residents in McKittrick visual quality is low to moderate, visual sensitivity is high, visibility ranges from moderate to high, and viewer exposure is low to moderate. Considering these factors, for residents visual impact susceptibility is moderate. For travelers on State Routes 33 and 58 visual quality is low to moderate, visual sensitivity is moderate, visibility is low to moderate, and viewer exposure is low to moderate. Considering these factors, for travelers on State Routes 33 and 58 visual impact susceptibility low to moderate.

Visual Impact Severity

Contrast

Existing Structures

The visible cooling tower plume from the proposed project would cause strong contrast to the surrounding existing structures (oil facilities). Color, line and texture contrast of the plume varies dependent on weather conditions in the area. Scale contrast would be high due to the visibility of the semi-rural setting mixed with oil production facilities in the area. The Berry Petroleum Co. and Anchor Refining Co., Inc. facilities are in the foreground of the proposed plant with various tanks and oil wells. To the extent of their contrast with the plume, the massive size of the plume contributes highly to the already diminished quality of the views the area. In summary, during the limited times over the year that the cooling tower plume will occur, it would cause high contrast in regard to form, scale, line, color, and texture.

Vegetation

The visible cooling tower plume from the proposed project considered in relation to vegetation would cause high contrast in regard to the low, rectilinear form of the Elk Hills and natural field grasses in the area. The plume would cause high contrast in regard to the line of the terrain. The white to light gray color of the plume would create high contrast with the seasonally green to tan colors of the vegetation. The plume's soft, irregular texture would contrast moderately to the more distinct but irregular texture of the vegetation. The plume would cause high contrast with the vegetation in regard to scale because it would appear taller than any vegetation when it is visible. In summary, in regard to vegetation, during the limited times over the year that the cooling tower plume would occur, the proposed project would cause high contrast in regard to form, line, color, and scale, and moderate contrast in regard to texture.

Land/sky

The cooling tower plume would cause high contrast in regard to the form of the land, which consists of flat valley views, some of which have the Elk Hills on the horizon.

The plume of stream rising from the cooling towers will occur intermittently, projecting upward as much as 1,000 feet from the ground under worst case conditions of temperature and atmospheric conditions.

The plume would cause high contrast in regard to the generally straight line of the horizon and the irregular line of the Elk Hills. The plume would cause high contrast regarding color when the sky is clear and low contrast when the sky is cloudy. The plume would cause moderate contrast with the moderately varied texture of the land. The plume would cause high contrast with the scale of the land, appearing taller than any land feature. In summary, in regard to land/sky, during the limited times over the year that the cooling tower plume would occur, the proposed project would cause high contrast in regard to form, line, color, and scale, and moderate contrast in regard to texture.

Scale Dominance

The cooling tower plume from the proposed project, although it would occur only during limited times of the year, because of its substantial height and width and middle ground distance, it would be a prominent element in the field of view, so the plume would create a co-dominant level of scale dominance.

Spatial Dominance

The cooling tower plume from the proposed project would vary in its location in the view depending on the viewpoint, so its spatial dominance would vary from subordinate to prominent in regard to composition. Because of its middle ground location, spatial dominance would be between prominent and subordinate in regard to position. Because the plume would be partially backdropped by sky, spatial dominance in regard to backdrop would be between prominent and subordinate. Overall, spatial dominance would be co-dominant.

View Blockage

From some residences in the viewshed the plume, during the limited times over the year it would occur, would block a moderate portion of the view of the Elk Hills. Therefore, the severity of view blockage would be moderate.

Visual Impact Severity

Because a) contrast of the cooling tower plume with existing structures would be high in regard to form, b) contrast with vegetation would be high in regard to form, line, and color, c) contrast with land/sky would be high in regard to form, line, and color, d) scale dominance would be co-dominant, and e) spatial dominance would be dominant, the cooling tower plume's visual impact severity would be very strong (see VISUAL RESOURCES Table B-1).

Visual Impact

For travelers on State Routes 33 and 58, visual impact susceptibility is low to moderate and the visual impact severity of the cooling tower plume, during the limited times of the year that it would occur, would be very strong, so visual impacts would be

less than significant. For residences, visual impact susceptibility is moderate and the visual impact severity of the cooling tower plume would be very strong. However, taking into account the limited times per year that the plume would occur, the generally poor weather conditions expected when the plume would occur, the small number of affected residences, and the distance of the plume from the residences, overall the visual impact would be less than significant.

WATER TANK

The proposed tank will be visible from homes along the east side of McKittrick, and views from urban residential areas, which are considered highly sensitive. The home closest to the tank site is at the corner of 4th Street and Reserve Road, about 0.87 miles southwest of the site. There are also four other homes on 4th Street from which the tank facility would be seen.

The proposed tank facility would also be visible from Reserve Road east of McKittrick, but views from this road are low in sensitivity. The tank will not be visible from State Highway 33 and 58.

The landscape in the vicinity of the proposed tank is inherently natural in character but visual quality has been substantially degraded by oil development facilities. Due to the cut pad proposed for the tank facility, 6 to 11 feet of the 24 foot tall tank would be blocked from view, with the greater screening occurring along the north side of the tank close to a knoll, the lesser screening along the south side away from the knoll.

The tank will intrude into the skyline as a rectilinear shape sharply contrasting in form with the subtle profile of the hills. There would be contrast in color because it would be painted to blend with the vegetation growing in the vicinity of the tank site. The tank would be a feature incongruous with the underlying natural character of the landscape and would present an adverse visual impact. However it would probably go unnoticed unless it were to be pointed out. The Berry Petroleum Co. and Anchor Refining Co., Inc. facilities in the foreground are the focus of attention; the proximity of the white and black tanks to the viewer, the extent of their distribution, and their large size all contribute to their domination of the view. In comparison, the proposed tank is distant and inconspicuous. Because much of the tank would be screened as indicated earlier, its impact would be less than significant.

COMMUNICATION TOWER

The tower will be nearly the same height of the tank. Given the fact that the existing visually dominant oil development facilities discussed earlier are the focus of immediate attention, the tower would not be the focus of attention. While the tower could be regarded as causing an adverse visual impact, visual quality is low to moderate. There would be no reduction in visual quality and by definition, the impact would be minimal.

CONSTRUCTION IMPACTS

PROJECT SITE

Project staging and material storage would take place on a portion of the La Paloma project site. These activities would be visually subordinate because they do not include prominent visual elements and they would be seen in the context of the adjacent land activities, which is rural. Therefore, project staging and material storage are not expected to cause any significant impacts. Fugitive dust disturbances could be visually prominent, but due to their short-term nature they are not considered as causing significant impacts. Tall stack construction would be of short duration, so impacts are not expected to be significant.

WATER AND NATURAL GAS PIPELINES

Because construction of any specific section of the gas pipeline would be completed in a short time, construction phase impacts from the pipeline are not expected to be significant.

CUMULATIVE IMPACTS

The proposed power plant would add a noticeable but not considerable increment to the existing industrial character in the McKittrick Valley. In regard to the potential for cumulative visual impacts from the La Paloma Generating Project, the proposed Elk Hills Power Project, the proposed Sunrise Cogeneration Project, and the proposed Midway-Sunset Project, none of the residential viewers with a view of one of these plants would have a view of the other plants, so the three plants would not cause a cumulative visual impact for local residents.

The power plant, while incrementally adding industrial features to the area, would not substantially lessen the already degraded visual conditions with the plume rising from 1,000 feet or more, as seen from the east side of McKittrick. Similarly, existing transmission lines within views in the vicinity of Buerkle Road and Mirasol Avenue, as well as within and around the town of Buttonwillow, cumulatively have significantly degraded visual conditions. The addition of another transmission line will cause an adverse impact, but will not noticeably lessen the already degraded conditions along the proposed and alternative routes. Therefore, there will not be a significant impact due to the cumulative impacts of the existing and proposed transmission lines.

FACILITY CLOSURE

INTRODUCTION

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure**.**

PLANNED CLOSURE

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The closure plan that the project owner is required to prepare should address removal of the power plant structures and the transmission poles to reduce visual impacts.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. The contingency plan that the project owner is required to prepare should address removal of the power plant structures and the transmission poles to reduce visual impacts.

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES REGULATIONS AND STANDARDS

LOCAL

COUNTY OF KERN

The applicant has proposed to prepare a Landscape Plan when final construction drawings of the project are completed. The Landscape Plan is intended to conform to the landscape requirements in Chapter 19.86 of the Kern County Zoning Code. Once available, the applicant will send a copy of the Landscape Plan to the Energy Commission for review. Staff recommends the adoption of a Condition of Certification to ensure that the Landscape Plan and its implementation satisfy the requirements of the Kern County General Plan and Zoning Code.

MITIGATION

The CEQA Guidelines (Title 14, California Code of Regulations, section 15370) defines mitigation to include:

a) Avoiding the impact altogether by not taking a certain action or parts of an action.

b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.

d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

e) Compensating for the impact by replacing or providing substitute resources or environments.

APPLICANT'S PROPOSED MITIGATION

SPECIFIC MITIGATION MEASURES

The Applicant has proposed two mitigation measures "to make the project more aesthetically acceptable" (LPGP 1998, p.5.13-37):

- Project facilities and transmission poles will be painted with neutral earth tone tan and gray colors that will blend with existing facilities and the background of grass-shrub-covered hills.

- To minimize nighttime light and glare, except as required by security and worker safety requirements, night lighting will be hooded to direct illumination downward and inward toward the power plant; illumination will be as low as reasonable.

EFFECTIVENESS OF THE APPLICANT'S PROPOSED MITIGATION MEASURES

The Applicant's proposed mitigation measures will act to reduce the potential significance of visual impacts associated with the generation project. Extensions of these measures and other measures, as proposed below by Energy Commission staff, will ensure that visual impacts will be minimized.

STAFF'S PROPOSED ADDITIONAL MITIGATION

STAFF MITIGATION 1 (CONDITION 1)

A specific painting plan in needed to assure that proposed colors will not unduly contrast with the surrounding landscape colors. Such a plan should be submitted at an early time so that any precolored buildings, structures and linear facilities can have colors approved and included in bid specifications for such buildings or structures.

STAFF MITIGATION 2 (CONDITION 3)

A specific lighting plan is needed to assure that project lighting will be adequately designed, shielded, and placed so as to minimize off-site light and glare. This plan should also minimize backscatter to the nighttime sky, and should include provisions

to minimize lighting of plant areas, consistent with operational and safety needs. A procedure is also needed to resolve any lighting complaints.

STAFF MITIGATION 3 (CONDITION 4)

A specific landscaping plan should be prepared showing the location of such landscaping, the varieties and sizes of plants proposed to be used in such landscaping, and the proposed time to maturity for such landscaping.

CONCLUSION AND RECOMMENDATION

CONCLUSION

With the proposed mitigation measures instituted, the visual impacts of the proposed power plant will be less than significant. The use of colors that blend with the existing setting will reduce the potential visual impact of the project structures to a less than significant level. Measures to minimize lighting effects will reduce such impacts to less than significant levels.

As discussed in staff's analysis of condensation plumes, meteorological conditions will determine the severity of the visibility during any given time. In addition, because of the project's rural setting, and limited number residences in the area, staff has determined that visual impacts due to condensation plumes will have no significant impact.

With the recent revision by LPGP to eliminate the Alternate Linear Route 1A, staff has reviewed the proposed linear route (Route 1) and determined that the linear facilities will not adversely effect views significantly. Given the concentration of existing transmission lines in the area, the proposed linear facilities would be co-dominant to the other transmission lines, and be relatively inconspicuous. Staff has provided mitigation (Staff Mitigation 1) which insures painting of the transmission poles to a color consistent with the surrounding area.

RECOMMENDATION

If the Energy Commission certifies the Project, staff recommends that the Commission adopt the following proposed conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Prior to first electricity generation, the project owner shall treat all project structures and transmission lines identified in the treatment plan in non-reflective colors to blend with the agricultural setting.

a. Prior to treatment of any project structures and transmission lines, the project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval.

The treatment plan shall include:

- specification and 11" x 17" color simulations of the treatment proposed for use on project structures, including structures treated during manufacture;
- a detailed schedule for completion of the treatment; and,
- a procedure to ensure proper treatment maintenance for the life of the project.

b. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan.

c. After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

d. For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

e. The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

f. The project owner shall notify the CPM within one week after all pre-colored structures have been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.

Verification: Not later than 60 days prior to ordering any structures that are to be color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval. If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan within 30 days of receiving that notification.

Verification: Not less than 30 days prior to first electricity generation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection. The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-2 All project fencing shall be non-reflective.

a. Prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

b. If the CPM notifies the project owner that specification revisions are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.

c. The project owner shall not order any project fencing until the project owner receives approval of the fencing specifications from the CPM.

d. The project owner shall notify the CPM after the fencing has been installed and is ready for inspection.

Verification: At least 30 days prior to ordering any non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval. If the CPM notifies the project owner that specification revisions are needed, the project owner shall prepare and submit to the CPM revised specifications for CPM review and approval, within 30 days of receiving that notification.

The project owner shall notify the CPM, in the next Monthly Compliance Report following installation of the fencing, that the fencing is ready for inspection.

VIS-3 The project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized.

a. Prior to first electricity generation, the project owner shall develop and submit a lighting plan for the project to the CPM for review and approval.

The lighting plan shall require that:

- Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized.

- The design of outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied;

b. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

c. Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

d. A lighting complaint resolution form (following the general format of that in attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

Verification: At least 60 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval. If the CPM notifies the project owner that any revisions of the plan are needed, the project owner shall submit to the CPM, for review and approval, a revised plan within 30 days of receiving that notification.

The project owner shall notify the CPM in the next Monthly Compliance Report that the exterior lighting installation is complete and ready for inspection.

Any lighting complaints received, and the outcome of those complaints shall be described in the next Monthly or Annual Compliance Report, as appropriate.

VIS-4 Prior to the start of commercial operation, the project owner shall implement a landscape plan that meets the requirements of the Kern County Zoning Code and provides a continuous screen of the proposed power plant from sensitive view areas.

a. The project owner shall submit to the CPM for review and approval a specific plan describing its landscaping proposal, stating that it conforms to Kern County's Zoning Code. The plan shall include, but not be limited to:

- a detailed landscape plan, at a reasonable scale, which includes a list of proposed tree and shrub species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives.
- maintenance procedures, including any needed irrigation; and
- a procedure for replacing unsuccessful plantings.

b. If the CPM notifies the project owner that plan revisions are needed, the project owner shall prepare and submit to the CPM a revised plan for CPM approval.

c. The trees and shrubs shall not be planted before the plan is approved. The project owner shall notify the CPM when the trees and shrubs have been planted and are ready for inspection.

Verification: At least 90 days prior to the start of commercial operation, the project owner shall submit the proposed landscape plan to the CPM for review and approval. The CPM will respond to the project owner within 15 days of receipt of the landscaping plan.

The project owner shall submit any required revisions within 15 days of notification by the CPM. The CPM will respond to the project owner within 15 days of receipt of the revised documents. The project owner shall notify the CPM in the next Monthly Compliance Report following completion of the proposed planting that the planting is ready for inspection.

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ATTACHMENT 1
LIGHTING COMPLAINT RESOLUTION FORM

LA PALOMA GENERATING PROJECT

Kern County

Complainant's name and address:

Phone number:

Date complaint received:

Time complaint received:

Nature of lighting complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted:

Description of corrective measures taken:

Complainant's signature: _____Date:

Approximate installed cost of corrective measures: $

Date installation completed:

Date first letter sent to complainant: _____(copy attached)

Date final letter sent to complainant: _____(copy attached)

This information is certified to be correct:

Plant Manager's Signature:

(Attach additional pages and supporting documentation, as required.)

VISUAL RESOURCES Figure 4
Location of Key Observation Points

VISUAL RESOURCES Figure 5
Key Observation Point #1

VISUAL RESOURCES Figure 6
Key Observation Point #2

VISUAL RESOURCES Figure 7
Key Observation Point #3

METHODOLOGY FOR ASSESSING VISUAL SETTING

Visual Factors

Commission staff evaluated a number of factors in assessing the visual setting of the proposed project. These factors include visual quality, viewer sensitivity, visibility, and viewer exposure.

Visual Quality

The visual quality of a setting is the value of visual resources in that setting, determined by the visible environment's intrinsic physical properties and by associated cultural or public values (Andrews 1979; Smardon et al. 1986). Where publicly adopted goals, policies, designations or guidelines exist, they are given great weight in assessing visual quality. Where they do not exist, the analyst relies on experience and judgment to assess visual quality. The relevant physical properties of the environment include landform, vegetation, water, color, scarcity, and cultural modifications.

A basic premise in the evaluation of visual quality is whether a project will be compatible with the character of the landscape. In the case of predominantly natural settings, projects should be compatible with this character. It is possible for new structures to be compatible with predominantly natural settings if such settings already contain some structures that are considered compatible and the new structures are similar to the existing structures and do not appreciably change the balance of natural and cultural elements. However, in areas that appear to be totally natural, any modification that appears to be human-made will change the character of the area.

Viewer Sensitivity

One of the principal factors evaluated in assessing the potential for visual impacts is the sensitivity level of potential viewers. Viewer sensitivity is a measurement of the level of interest or concern of viewers regarding the visual resources of an area. It is generally expressed as high, moderate, or low. Local values and goals affect a viewer's expectations regarding a visual setting (Blair 1980). Concern regarding a change to a visual setting is often due at least in part to the symbolic effect of the change. A basic document for visual impact assessment states that

> "more often it is symbolic meaning, not preference, which motivates our value judgments and reactions" (Schauman 1986, p.105).

A visual change can be perceived as a symbol of a threat to the cultural stability and identity of a group or community (Costonis 1982). Viewer sensitivity can be determined in two ways, directly through evaluation of viewer attitudes or indirectly using viewer activities.

Viewer Attitudes (direct)

The direct determination of viewer attitudes is normally done by surveying potential viewers. As mentioned above in the discussion on Visual Quality, the accurate determination of such information is very complex, involves well-designed, implemented and interpreted surveys, is usually labor intensive, and is usually expensive. Given these constraints and the mandated time schedule for power plant siting cases, it is generally not possible for Commission staff to conduct such a direct determination of viewer attitudes and be assured of accurate and valid results.

Viewer Activities (indirect)

In situations where direct information on viewer sensitivity cannot be obtained, indirect methods are typically used in the visual profession to gain an insight as to viewers' sensitivity regarding visual resources. Land use is considered a "useful indirect indicator of likely viewer response" (Blair 1986), and activities associated with some uses can result in an increased awareness of visual or scenic resources (Headley 1992). Use activities associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are usually highly sensitive. Commercial uses are generally less sensitive as activities, and views are often focused on those commercial activities. Large scale industrial or agricultural processing facility uses are usually the least sensitive because workers are focused on their work, and often are working in surroundings with relatively low visual value.

Visibility

Another important factor in assessing the existing visual setting, and thus potential impact is the visibility of the project. Visibility can differ substantially between view locations, depending on screening and the effect of the location of the visual change in the view. The smaller the degree of screening, the higher the visibility usually is and the greater the potential impact is likely to be. One factor potentially affecting screening is the season. Deciduous trees that provide substantial screening in summer may provide little screening in winter. Angle of view is also important. The closer the feature is to the center of the view area, the greater the impact is likely to be. Meteorological conditions can also affect visibility. For example, fog can make a cooling tower plume or stack plume unnoticeable, given particular fog density and distance from the viewer to the plume. Another factor affecting visibility is time of day. Although projects are generally more noticeable during daylight hours, lighting can make project structures and plumes more noticeable at night than during the day.

Viewer Exposure

The degree to which viewers are exposed to a view by (a) their distance from the feature or view in question, (b) the number of viewers, and (c) the duration of view is called viewer exposure (Grinde and Kopf 1986). Viewer exposure is important in determining the potential for a change in the visual setting to be significant.

Distance

As the distance between the viewer and the feature viewed increases, the perceived size of the feature and the ability to see details decreases. Distance zones may be usefully categorized as follows: foreground, or close-range; middleground, or mid-range; and background, or long-range. Within close-range distances, details such as surface textures and the fullest range of surface colors are clearly perceptible. Mid-range distances are characterized by visualization of complete surface features such as tree stands, building clusters, and small landforms. Long-range distances are dominated by the horizon and major landforms (Felleman 1986).

Numbers of Viewers

Two measures of the number of viewers are important to consider in assessing the potential visual impact of a project. One is the absolute number of viewers. The other is the proportion of viewers in a viewshed who can see the project.

Duration of View

The length of time that a view is visible to a viewer is another important factor to be considered in determining the importance of a view and the potential impact of a project. For a given activity, the longer the view duration, the greater the potential importance or impact. View durations range from a few seconds, as in the case of some travelers in motor vehicles, to a number of hours per day, in regard to some residential situations.

Key Observation Points

The evaluation factors discussed above are considered in relation to Key Observation Point. Key Observation Points are chosen to provide the basis for evaluation of project impacts by comparing the appearance before and after project construction. Key Observation Points include locations which are chosen to be representative of the most critical locations from which the project will be seen. Additional Key Observation Points should be selected that represent typical views encountered in different classes of views within the viewshed, if they are not covered by critical viewpoints. Variables that should be considered in selecting Key Observation Points include relative project size, season, and light conditions.

METHODOLOGY FOR ASSESSING VISUAL IMPACTS

Use of Objective vs. Subjective Methods

The determination of visual resource impacts has traditionally been done using a completely subjective method relying exclusively on the knowledge and experience of the visual resources professional. The drawback to this approach is that it is difficult to relate the steps and process used in the analysis which lead to the conclusions which are drawn regarding visual impacts.

In the 1970s and 1980s, there was an attempt in the profession to develop more objective methods for determining potential impacts. While this led to a more understandable set of steps and processes, analyses often did not account for unusual situations not addressed by the standard procedure or gave the false impression that they were totally objective.

In recent years visual resource analysts have been developing a synthesis, in which an objective methodology has been used to develop the categories and the analysis process to be used in analyzing visual impacts, at the same time explicitly recognizing that subjective values are involved in selecting factors and assigning weights to factors. It is important that subjective judgements be identified and defined to the extent possible.

Key Observation Points

As previously discussed, Key Observation Points include locations which are chosen to be representative of the most critical locations from which the project will be seen. For linear projects such as power lines, additional Key Observation Points are selected that represent any special project or landscape features such as skyline crossings, river crossings, or substations.

Because each Key Observation Point represents a critical location, a typical view encountered in a class of view, and/or a special project or landscape feature, it also represents an important specific aspect of the viewshed that is susceptible to visual impacts. Therefore, the visual impact of a project is determined for each Key Observation Point, not from an "overall" perspective that masks the specific impacts.

Major Impact Evaluation Factors

For each Key Observation Point Commission staff considers the susceptibility to visual impact and the severity of impact are considered together to determine the significance of impact. The following sections explain how these two major factors are assessed and considered. Other potential causes of significant visual impacts, such as night lighting, visible emission plumes, and noncompliance with laws, ordinances, regulations, and standards, are addressed separately in this analysis.

Susceptibility to Impact

The first step in evaluating the visual impact of a project from a particular Key Observation Point is to consider the elements of the existing visual setting (discussed previously), including visual quality, viewer sensitivity, visibility, and viewer exposure. Each of these factors is assessed as either high, moderate to

high, moderate, low to moderate, or low. Staff combines these factors into a measure of the susceptibility of the view from a particular Key Observation Point to visual impact. A low value for any of the four factors generally results in low susceptibility to impact.

Impact Severity

As previously discussed, the degree of visual impact that a project will cause depends on the degree of change resulting from the project upon visual character or visual quality, here called the impact severity. Commission staff considers both the relationship of the project to the other components visible in the landscape, and blockage from view or elimination by the project of any previously visible components.

Relationship of the Project to Other Visible Components

Landscape Components

The three basic landscape components are land and water, vegetation, and structures.

Visual Elements

The basic elements of each physical component of a view include color, form, line, texture, scale, and spatial character. The impact of a project is assessed in terms of contrast in color, form, line, texture, and scale, as well as scale dominance and spatial dominance. Scale is the proportionate size relationship between an object and its surroundings. Absolute scale is the size of an object obtained by relating its size to a definitely defined standard (i.e., measurement). Relative scale is the relative size of objects; the apparent size relationship between landscape components. Sub-elements of scale include *scale dominance* (the scale of an object relative to the visible expanse of the landscape and to the total field of view of the human eye or camera) and *scale contrast* (the scale of an object relative to other distinct objects or areas in the landscape). *Spatial dominance* is the measure of the dominance of an object due to its location in the landscape. Regarding these three factors, a change has the greatest potential to cause impacts in regard to scale dominance, and the least potential in regard to scale contrast.

Assessment of Contrast

Staff assesses contrast with existing structures, vegetation, and land/water in regard to color, form, line, texture, and scale. Regarding these factors, contrast in color, form, or line has greater potential to cause impacts than contrast in texture or scale.

The magnitude of the visual impact of a project is measured by the degree of change that it causes. In regard to contrast, the degree of change depends partly on the existing levels and types of contrast. For instance, if existing structures already contrast strongly with natural features, the addition of a similar structure tends to cause a smaller change than if no structures already existed. In addition, the degree of contrast depends on the proximity of the project to the landscape component to which it is compared. If a project is superimposed on a component (such as body of water), the potential for contrast is greater than if the project is near such a landscape component, and even greater than if the project is far from the landscape component.

Factors Affecting Contrast

Among the basic characteristics of the visual setting previously discussed, distance is a factor in determining the visual contrast that a project will create. Increasing distance can decrease perceived contrast both by reducing the apparent size of project structures and by reducing clarity of view due to atmospheric conditions.

Several additional factors can also influence the degree of contrast that a project may cause. These include atmospheric conditions, light conditions, motion, seasonal changes, and recovery time (BLM 1986).

Blockage or Elimination of Existing Elements

In regard to obstruction or elimination of previously visible components, the analysis evaluates any change between the visual quality of those components compared to the visual quality of the project. Blockage of higher quality visual elements by lower quality elements can cause impacts, potentially as great as those regarding scale dominance.

Assessment of Visual Impact Severity

VISUAL RESOURCES Table B-1 shows how staff calculates impact severity from each Key Observation Point.

Determination of Significance

Commission staff considers the following factors in determining whether a visual impact will be significant. These factors are not a complete listing of all the considerations that staff uses in its analyses, because many such considerations are site-specific.

State

The California Environmental Quality Act Guidelines make it clear that aesthetic impacts can be significant adverse impacts by defining Asignificant effect≅ on the environment to mean a Asubstantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including . . . objects of historic or aesthetic significance. (Cal. Code Regs., tit.14, э 15382.) Appendix G, subdivision (b), of the Guidelines state that a project Awill normally have a significant effect on the environment if will have a substantial, demonstrable negative aesthetic effect.

VISUAL RESOURCES Table B-1
Staff's Visual Impact Severity Assessment Process

	SEVERITY SCORE				
	Extreme	**Strong**	**Moderate**	**Weak**	**Negligible**
SEVERITY FACTOR					
CONTRAST					
Color Contrast		High	Medium		Low
		Or	Or		or
Form Contrast		High	Medium		Low
		Or	Or		or
Line Contrast		High	Medium		Low
		Or	Or		or
Texture Contrast			High	Medium	Low
			Or	or	or
Scale Contrast			High	Medium	Low
			or	or	or
DOMINANCE					
Scale	Dominant	Co-Dominant	Subordinate		Insignificant
		Or	Or		or
Spatial		Dominant	Co-Dominant	Subordinate	Insignificant
VIEW BLOCKAGE	Substantial blockage of high quality view	Moderate blockage of high quality view or substantial blockage of moderate to high quality view	Minor blockage of high quality view, moderate blockage of moderate to high quality view, or substantial blockage of moderate quality view	Minor blockage of moderate to high quality view, moderate blockage of moderate quality view, or substantial blockage of low to moderate qual. view	Minor blockage of moderate, low to moderate, or low quality view; moderate blockage of low or low to moderate quality view; or substantial blockage of low quality view
COMBINED FACTORS	Two or more of the above factors with a severity score of strong.				

Local

As discussed above, Commission staff considers any local goals, policies or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts.

Professional Standards

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see, e.g., Smardon 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities:

Will the project substantially alter the existing viewshed, including any changes in natural terrain?

Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?

Will the project substantially degrade the existing visual quality of the viewshed or eliminate or block views of valuable visual resources?

Will the project significantly increase light and glare in the project vicinity, particularly night-time glare?

Will the project result in significant amounts of backscatter light into the night-time sky?

Will the project be in conflict with directly-identified public preferences regarding visual resources?

Will the project comply with local goals, policies, designations or guidelines related to visual quality?

Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?

Will the project result in a substantial visible exhaust plume?

Commission staff considers these questions, where applicable, in its impact assessment.

Consideration of Impact Susceptibility and Impact Severity

For most operations impacts staff considers the assessment of the impact susceptibility in relation to the impact severity from each Key Observation Point to determine visual impact. Staff considers construction impacts, lighting impacts, and visible plume impacts separately.

Cumulative Visual Impacts

Staff reviews the proposed project and its related facilities as well as other past, present, and future projects in the vicinity to determine whether potential cumulative visual impacts will occur and whether those impacts will be significant. In addition, in the case of cogeneration facilities where the proposed power plant is to be part of an already existing industrial facility, this review examines whether the addition of the proposed project and its related facilities will result in cumulative visual impacts and whether they will be significant. If past activities have resulted in significant impacts, and the project will appreciably increase the total impact, the project will contribute substantially to a significant cumulative impact. When cumulative visual impacts are found to be significant, whether in relation to other proposed projects or to the host industry, feasible mitigation measures will be recommended to reduce those impacts.

REFERENCES TO APPENDIX B

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CULTURAL RESOURCES

Testimony of Kathryn M. Matthews

INTRODUCTION

This analysis discusses cultural resources which are defined to include the structural and cultural evidence of the history of human development and life on earth. Evidence of California's early occupation is becoming increasingly vulnerable due to the ongoing development and urbanization of the state.

Cultural resources are significant to our understanding of our culture, our history and heritage. Critical to the analysis of cultural resources are the spatial relationships between an undisturbed cultural resource site and the surface environmental resources and features, and the analysis of the locational context of the resource materials within the site and beneath the surface. These relationships provide information that can be used to piece together the sequence of human occupation and use of an area, and they begin to create a picture of the former inhabitants and their environment.

The determination of potential impacts to cultural resources from the proposed La Paloma Generating Project (LPGP) is required by the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Impacts to cultural resources may result either directly or indirectly during pre-construction or construction of the project.

Three aspects of cultural resources are addressed in this analysis: prehistoric and historic archaeologic resources, and ethnographic resources.

PREHISTORIC RESOURCES

Prehistoric archaeologic resources are those materials relating to prehistoric human occupation and use of an area; these resources may include sites and deposits, structures, artifacts, rock art, trails and other traces of prehistoric human behavior. In California the prehistoric period began over 10,000 years ago and extended through the 18th century when the first Euro-American explorers settled in California.

HISTORIC RESOURCES

Historic archaeologic resources are those materials usually associated with Euro-American exploration and settlement of an area and the beginning of a written historical record; they may include archaeological deposits, sites, structures, travelled ways, artifacts, documents, or other evidence of human activity. Under state requirements, cultural resources must be greater than 100 years old to be considered historic resources, while under federal requirements, such materials are considered if they are greater than 50 years old.

ETHNOGRAPHIC RESOURCES

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans, African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, § 431-433) and subsequent related legislation, policies and enacting responsibilities, e.g. federal agency regulations and guidelines for implementation of the Antiquities Act. The following laws, ordinances, regulations, standards and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed for compliance with these laws.

FEDERAL

- National Environmental Policy Act (NEPA): Title 42, United States Code, sections 4321-4327, requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.

- Federal Land Policy and Management Act (FLPMA): Title 43, United States Code, Chapter 35, Sub-Chapter VI, Sections 1781-1782; requires the Secretary of Interior to retain and maintain public lands in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric water resource, and archeological values [Section 1781(a)(8)]; the Secretary, with respect to the public lands, shall promulgate rules and regulations to carry out the purposes of this Act and of other laws applicable to public lands [Section 1740].

- Federal Guidelines for Historic Preservation Projects: The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service.

- Section 106 of the federal guidelines sets forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places (NHRP). The eligibility criteria and the process are used by federal, state and local agencies in evaluating the significance of cultural resources. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the State Register of Historic Resources.

- Executive Order 11593, “Protection of the Cultural Environment,” May 13, 1971, (36 Federal Register, 8921) orders the protection and enhancement of the cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values

- American Indian Religious Freedom Act; Title 42, United States Code, Section 1996 protects Native American religious practices, ethnic heritage sites, and land uses.

- Native American Graves Protection and Repatriation Act (1990); Title 25, United States Code Section 3001, *et seq.* defines “cultural items”, “sacred objects”, and “objects of cultural patrimony”; establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for return of specified cultural items

STATE

- California Environmental Quality Act (CEQA) Guidelines: California Code of Regulations, section 15064.5 “Determining the Significance of Impacts to Archaeological and Historical Resources. This section defines an archaeological or historical resource and sets forth the procedures for determining whether a project would have a significant impact on such resources.

- California Environmental Quality Act (CEQA): California Code of Regulations, section 21083.2 “Significant Effect on Archaeological Resources”. The lead agency shall determine whether a project shall have a significant effect on “unique” archaeological resources.

- CEQA Guidelines, section 15064.5 “Determining the Significance of Impacts to Archaeological and Historical Resources”. Sub-section (a) section defines the term “historical resources”. Subsection (b) states when a project may be deemed to have a significant effect on the environment (pertinent to historic resources) and defines terms used in describing those situations. Subsection (c) is entitled, “CEQA applies to effects on archaeological sites:” and continues with a description of the circumstances in which it applies and provides a bridge between the application of the terms “historic resources” and a “unique archaeological resources”.

- California Environmental Quality Act (CEQA) Guidelines: California Code of Regulations, section 15064.7 “Thresholds of Significance”. This section encourages agencies to develop thresholds of significance to be used in determining potential impacts and defines the term “cumulatively significant”.

- California Environmental Quality Act (CEQA) Guidelines, Appendix G, Environmental Checklist Form”:

- In the list of issues and sample questions, on page 6 is “ISSUE V: CULTURAL RESOURCES”. There are four questions to be answered in determining the potential for a project to impact archaeological, historic, and paleontologic resources.

- Public Resources Code, Section 5020.1 defines several terms, including the following:

  (j) “Historical resource” includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

  (k) “Substantial adverse change” means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

  Public Resources Code, Section 5024.1 establishes a California Register of Historic Places; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures.

- Public Resources Code, section 5097.5. Any unauthorized removal of archaeologic or historic resources or sites located on public lands is a misdemeanor. As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority or public corporation, or any agency thereof.

- California Health and Safety Code, section 7050.5. If human remains are discovered during construction, the project owner is required to contact the county coroner.

- Public Resources Code, section 5097.98. If the county coroner determines that the remains are Native American, the coroner is required to contact the Native American Heritage Commission, which is then required to determine the “Most Likely Descendant” to inspect the burial and to make recommendations for treatment or disposal.

LOCAL

Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies.

KERN COUNTY

According to the Application for Certification (AFC), there are no applicable local LORS (LPGP 1998a). Kern County staff indicated that they do not have a specific county policy that addresses cultural resources but they do ensure compliance with CEQA (Forrest 1999).

ENVIRONMENTAL SETTING

REGIONAL DESCRIPTION

The project area is located in the Great Valley Physiographic Province of California, bounded on the south by the Transverse Range, on the east by the Sierra Nevada Range, on the north by the deltas of the San Joaquin and Sacramento rivers, and on the west by the Temblor Range (an interior portion of the Coast Ranges). The southern part of this province is called the San Joaquin Valley. At one time, this entire valley was covered by ancient salt- and fresh-water seas. As late as the 1840s, prior to the control of water resources for irrigation, the southern-most portion of the San Joaquin Valley was seasonally flooded by Lake Buena Vista. At its highest watermark, the lake covered an area of 760 square miles. The shorelines of ancient Lake Buena Vista are located within thirty miles of the current project area. Today the project region is generally arid and barren with no permanent streams. Refer to the **Project Description** section of this document for a map of the project development region.

The proposed La Paloma Generating Project (LPGP) is located in the McKittrick Valley that runs generally northwest to southeast between the low hills that border the southwestern margin of the central valley and the foothills on the eastern side of the Temblor Range. Geologic activity in the McKittrick area has caused tremendous folding and squeezing of the underlying rock and the area is known archaeologically for the chert outcroppings which were quarried by prehistoric humans for materials to make stone tools. Other geologic conditions caused underlying petroleum deposits to work their way to the surface along fault lines forming tar seeps that were also used by native peoples, as well as modern-day humans (LPGP 1998a).

PREHISTORIC SETTING

The archaeological literature indicates that early residents of California typically lived near water sources that could provide them with access to a wide variety of plant and animal resources. Evidence from archaeological sites found along the shorelines of ancient Lake Buena Vista and the nearby ancient Lake Tulare, both located several miles east and southeast of the project area, indicates that native peoples may have occupied the project area as early as 8,000 years ago. Surrounding these lakes were great marshy sloughs and wetlands, well populated by animals and waterfowl (LPGP 1998a).

There have been several different chronologies proposed for the project region. Evidence from archaeological sites excavated in the 1930's led archaeologists to tentatively conclude that there were type relationships between archaeological assemblages found in the project area and those found outside the region. Some of the points discovered along the shorelines of ancient Lake Tulare suggest that the site could possibly have been populated by hunters of big game as early as 11,000 years ago. Excavations in 1964 revealed artifacts in close proximity to fresh-water shell, but dates from freshwater shell can be subject to error and artifacts found in close proximity to this shell might not share the same dates (LPGP 1998a).

ETHNOGRAPHIC BACKGROUND

The prehistoric marshland environment was rich in fish, waterfowl and other animals. It was an abundant source of many necessities of life and it is likely that, with such resources, many tribes were able to maintain residences in the same place through most of the year. The project area is located within the ethnographic boundaries of the Southern Valley Yokuts (Wallace 1978). The town of Buttonwillow was originally a Yokuts meeting place and dance ground. Yokuts tribal groups living in the area were the Tulamni, focused in the project area near Lake Buena Vista and the Chuxoxi who inhabited the Kern River Delta, located on the northeasterly edge of Lake Buena Vista (LPGP 1998a). (LPGP 1998a).

The literature indicates that the Chumash peoples traditionally occupied the Pacific coastal areas in the Santa Barbara County region, but their land use may have extended across the Temblor Range into the area traditionally occupied by the Yokuts (LPGP 1998a; Grant 1978). The Chumash presence in the central valley may only have been peripheral and it's unlikely they occupied areas as far north as the project area, but trade relationships between them and the Yokuts were possible. Thus, portions of the project area may have been influenced archaeologically by both the Chumash and the Yokuts peoples. Archaeological artifacts associated with the Chumash include beads, fine baskets, projectile points, sandstone, oak and steatite bowls. The Chumash are also well known for extraordinary rock art and numerous sites have been recorded within their traditional lands in the coastal range (LPGP 1998a).

EARLY SETTLEMENT AND DEVELOPMENT

In 1772 Pedro Fages, accompanied by European explorers, pursued deserters from the Spanish army through the San Joaquin Valley. No permanent settlements were established until the late 1830's, when Mexico began to grant ranchos to Mexican and foreign settlers. The AFC indicates that both the "Rancho El Tejon" and the "Rancho San Emigdio" lie in the southern part of the project area. Today, Rancho El Tejon is one of the San Joaquin Valley's most important historic sites (LPGP 1998a).

Within the last century there has been significant oil field development along the western edges of the southern San Joaquin Valley. Later in this century, the availability of water for irrigation has allowed for development of large tracts of land for major agricultural production. The northern portion of the project site has been considerably disturbed by on-going oil production (LPGP 1998a).

In Kern County, the railroad expanded to accommodate oil production. There was ongoing oil development in the McKittrick area prior to 1899. The McKittrick oil field was one of several oil fields that served to make Kern County into a major oil-producing region. There is evidence of oil production or railroads in several areas affected by the proposed project and associated linear facilities. However, sites of potential historic concern have been previously determined either not eligible for the National Register, or, if the sites were not formally evaluated, they have been disturbed by agriculture and oil production and are not in a condition that warrants eligibility for the Register (LPGP 1998a).

PRE-AFC LITERATURE AND RECORDS SEARCH

Prior to preparation of the AFC, consultants to the applicant reviewed literature, site records and maps at the Southern San Joaquin Valley Information Center of the California Historical Resources Information System (CHRIS). For the La Paloma project, the literature and records search focused on the Area of Potential Effect (APE) for project construction and operation. The APE is defined as the area within 100 feet around the power plant site and associated parking, storage or laydown areas, and within 100 feet from the centerline of the routes for all linear facilities and access routes. The record search also included adjacent areas located up to 0.25 miles away from the project site and linear routes. Results of the literature review were summarized in the AFC and site-specific information was filed with the Energy Commission under separate cover to maintain confidentiality of sensitive resource locations (LPGP 1998a). For more detailed information on the results of the literature review, refer to the summary in the Section 5.7 of the AFC.

FIELD SURVEYS

The record search indicated that only portions of the project site and linear facility routes had undergone previous surveys for archaeological resources and some of those surveys were completed more than five years ago. As noted in the AFC and in Confidential Appendix L, thirteen (13) sites and ten (10) isolates had been recorded within the APE or within the 0.25 mile radius of the APE (LPGP 1998e). Per Commission requirements, site-specific information on these known resources was filed with the Energy Commission under separate cover to maintain confidentiality of sensitive resource locations (LPGP 1998e).

A pre-AFC, “intense pedestrian survey” (BLM Class 3 survey), of the project APE was completed by archaeological resource specialists between April 20th and 24th, 1998. An additional five sites and two isolates were newly recorded during the field surveys and several previously recorded sites were found and re-recorded as part of the surveys for the current project (LPGP 1998e). In August 1998, after the AFC was filed, additional surveys were conducted in areas that were not accessible during April 1998.

In early 1999, additional cultural resource surveys were conducted for a 1.3-mile long route revision for the electric transmission line that was re-routed to go around state Fish and Game lands rather than cross them, and for a new water tank site, and for a adjustments to the water pipeline route near the tank (LPGP 1999a).

POWER PLANT SITE

The 23-acre project site and the adjoining ten-acre and fifteen-acre laydown sites are located approximately 2 miles east-southeast of the town of McKittrick, California. The record search indicated that no previous surveys had been conducted on these sites. Surveys of the sites were conducted in April 1998 and surveyors walked in a series of transects spaced about 20 meters apart. Portions of the sites were covered by heavy vegetation that reduced visibility to about 25%. The proposed power plant site and laydown areas are described as previously disturbed by oilfield development and use. Numerous remnants of oil production

equipment were found during surveys of the project site and some of it may be more than 45 years old. The remains of two oil pumping / drilling platforms were recorded but they appear to lack integrity and they did not appear to qualify for eligibility to the National Register (LPGP 1998e).

ELECTRIC TRANSMISSION LINES

The proposed 14.2-mile, electric transmission line route (Route 1) and one 1.7-mile alternative to a short segment of the route (Route 1A) were described in the AFC. Surveys of all but the last four miles of the original alternative routes as they approach the Midway Substation, were conducted between April 20th and 24th, 1998. Surveyors did not receive access to the lands affected by the last four miles of Route 1 and alternate Route 1A until August of 1998. Surveyors walked in transects spaced between fifteen and twenty meters apart and the width of the corridor surveyed varied, based on the location within the route and the potential for more than one linear facility to be built in parallel within the route. The AFC describes the ground surface along the transmission corridor indicates as ranging from relatively flat to moderate slope. Due to heavy vegetative cover, surveyors also examined soil exposures in road cuts or along dirt roads (LPGP 1998a; 1998e).

The pre-AFC record search indicated that six cultural resource sites and ten isolates have been recorded within one-quarter mile of the proposed transmission route (Route 1). Two of the sites are described as prehistoric lithic scatters and one also contained what appeared to be human bone fragments and artifacts of potential antiquity. Neither site has been fully evaluated for significance (LPGP 1998e). Three new sites and three isolates were found during project-related surveys. A previously recorded railroad berm was re-located and the record updated during the survey.

In early March 1999, alternative Route 1A was withdrawn from further consideration by La Paloma and a second alternative to the proposed route (Route 1B) was proposed to avoid crossing a state-managed natural resource preserve. An intensive survey of the new alternative route 1B was conducted in March 1999 and one modern trash dump was encountered. Surveyors walked transect intervals of 15 to 20 meters apart and covered a corridor of 100 feet on either side of the transmission center line, plus a 200-foot radius circle around the site of each transmission pole.

WATER SUPPLY PIPELINES

Two alternative routes have been proposed for the power plant water supply pipeline. Route 2 extends for a distance of about 8.6 miles from a turnout at the State Water Project Aqueduct to the project site, while Route 3 extends for a distance of 8.4 miles between these facilities. The initial four miles of routes 2 and 3 are the same and portions of this section would be built under an existing roadway. In the vicinity of the Elk Hills, the routes cross through areas of moderate terrain relief and then the land flattens out as it drops down toward the valley (LPGP 1998a).

Where these routes parallel portions of the transmission line route, the list of known, sites and isolates on record is the same and the corridors were surveyed at the same time. The record search indicated that a number of isolates have been recorded in the vicinity of the old river channel but apparently there was no other evidence of sub-surface deposits. During the pre-AFC surveys, portions of the pipeline corridors were heavily vegetated so visibility ranged between thirty to fifty percent. No new cultural resources were found during the surveys (LPGP 1998a; 1998e). In March 1999, Route 3 was dropped from further consideration by LA Paloma. (LPGP 1998e).

A second, 1.5-mile long water pipeline is proposed to bring potable water to the project site from the town of McKittrick. The proposed route follows an existing paved road in an area that has been disturbed by oilfield development and road construction and maintenance. A trash scatter possibly associated with the old railroad was previously recorded along this route but it has been determined not eligible for the National Register. No new cultural resource were found during pre-AFC surveys (LPGP 1998a; 1998e).

NATURAL GAS SUPPLY PIPELINES

The natural gas supply pipeline will run for a short, 0.07 mile distance through an area that has been disturbed by oilfield development. No cultural resources have been recorded and none were observed during the pre-AFC surveys (LPGP 1998a; 1998e).

ARCHITECTURAL RECONNAISSANCE

Due to a long history of oil production that continues today, land in the project area is in a disturbed state. The two abandoned oil drilling/pumping platforms found on the project site could be older that 45 years, but the sites no longer have integrity due to considerable disturbance by oil field development. Surveys of the various corridors for the transmission lines and pipelines revealed only an additional section of railroad berm and a trash heap, neither of which appeared to meet criteria for historic significance (LPGP 1998a; 1998e).

NATIVE AMERICAN CONTACTS

Prior to the beginning of fieldwork, the consultant to the applicant contacted the state's Native American Heritage Commission (NAHC) to request information on sacred lands within the project area (LPGP 1998a). The NAHC maintains a list and maps of traditional sacred sites located on public and private lands throughout the state. The Heritage Commission also can refer staff, applicants, consultants and members of the public to registered Native American representatives for each part of the state who can assess the potential for a specific project to impact Native American sites or values.

In response to the project consultant's request, no sacred properties were identified within the project area (including a one-quarter mile radius study area), but this information often remains protected. In its response, the NAHC provided a list of Native American contacts. Confidential Appendix L contains a sample of the letter sent to the Native American representatives for the project area and a summary of

the contacts undertaken. As of July 1998, there was only one phone call in response to the applicant's inquiry. The caller said that she would follow up with a letter (LPGP 1998a).

IMPACTS

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed LPGP project has the potential to adversely affect both known and previously unknown cultural resources. Impacts to cultural resources may result either directly or indirectly during the pre-construction, construction and operation of the project. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, or excavation. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource materials due to improved accessibility.

Based upon CEQA, the Warren-Alquist Act, and the Energy Commission siting regulations, the Commission staff must evaluate the potential for significant impacts from a proposed project on sensitive cultural resources. The significance of any cultural resources materials recovered during project construction is determined by a qualified cultural resource specialist, based upon established criteria.

SIGNIFICANCE CRITERIA FOR CULTURAL RESOURCES

When a potential for discovery of cultural resources has been identified through literature search and reconnaissance surveys, there is a potential for project-related impacts to any resources actually present. However, the potential for discovery does not measure the full significance of individual cultural materials present, since it is impossible to accurately predict what individual artifacts or sites could be discovered. The significance of recovered cultural resources can only be determined after they have been mapped and recorded, collected, prepared and analyzed by professional archaeologists and historians.

Significant cultural resources are those that meet established scientific criteria that are generally accepted by professional archaeologists, historians and cultural resource specialists. Under federal law, the criteria for determining a significant impact to cultural resources differs from that of state law.

FEDERAL CRITERIA

Title 36, Code of Federal Regulations, section 60.41, sets forth the following criteria for determining eligibility for the National Register of Historic Places:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that also:

(a) are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) are associated with the lives of persons significant in our past; or

(c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction; or

(d) have yielded or may be likely to yield information important in history or prehistory.

STATE CRITERIA

CEQA indicates that a project will have a significant adverse effect if it impacts "unique" archaeological resources, a category that is narrowly defined by statute. (Public Resources Code, section 21083.2), as follows:

- "Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information";
-
- "Has a special and particular quality such as being the oldest of its type or the best available example of its type";
-
- "Is directly associated with a scientifically recognized important prehistoric or historic event or person."

Title 14, California Code of Regulations, section 15064.5(e) defines "Historic resources" to include archaeological resources, and is more encompassing that the resources protected according to their "unique" status.

Section 21084.1 of the Public Resources Code would require a finding of significant impact for any project that may have a "substantial adverse change" on the historical significance of a "historic resource" which is defined to include those archaeological resources that are either listed on or eligible for listing on the California Register of Historic Resources. Such adverse changes include demolition, destruction, relocation, or alteration of the resource [Title 14, California Code of Regulations, section 15064.5 (b)(1)].

Generally, a resource is considered to be "historically significant" if the resource meets the following criteria for listing in the California Register of Historic Resources:

- It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

- It is associated with the lives of persons important in our past;

-
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;
-
- It has yielded, or may be likely to yield, information important in prehistory or history (Public Resources Code, section 5024.1).

However, the fact that a resource is not listed in, or determined to be eligible for listing in, the California Register of Historical Resources, not included in a local register of historical resources, or not deemed significant pursuant to criteria set forth in subdivision (g) of Public Resources Code Section 21083.2 shall not preclude a lead agency from determining whether the resource may be an historical resource for purposes of this section.

THE POTENTIAL FOR IMPACTS TO CULTURAL RESOURCES

The determination of potential impacts to cultural resources from the proposed LPGP is required by the Siting Regulations of the California Energy Commission (Energy Commission) and by CEQA. Impacts to cultural resources may result either directly or indirectly during pre-construction or construction of the project. As described in the AFC, the potential for significant project impacts to cultural resources is directly related to the likelihood that such resources are present and whether they are actually encountered during project development activities. A determination of the potential for discovery of cultural resources is based on the results of the literature review and field surveys. Basically, the more cultural resource sites and materials reported in an area, the greater the potential for future discoveries in the vicinity.

The AFC and supplementary filings indicate that a total of 31 cultural resource sites and isolates have been recorded within one quarter mile of the proposed power plant site area or within the corridors of project-related linear facilities. Several of these sites have not yet been evaluated to determine their possible significance. There is a potential for construction of the transmission lines and portions of the water pipeline to impact to known cultural sites unless final design avoids construction in the vicinity of these resources (LPGP 1998a; 1998e).

Often the potential for a project to impact previously unknown cultural resources cannot be fully evaluated until the sub-surface is exposed by excavation, trenching, and/or augering. Given the number of sites located near portions of the project site or the linear facility routes, the recorded occurrence of numerous isolates, and evidence of human habitation over a period of thousands of years, the proposed project has the potential to impact cultural resources. Staff's objective is to ensure that there will be no adverse impacts to significant or unique cultural resource materials during project development and construction.

POWER PLANT SITE

As described in the AFC, the elevation of the proposed 23-acre plant site slopes gently from an elevation of 997 feet at the southwest corner to 956 feet Above Sea

Level (ASL) at the northeast corner. In preparing for project construction, the site will be leveled using cuts and fills to an average elevation of 982 feet ASL. An estimated fifteen feet of material will be cut from the high points and moved to fill the low spots. In all, the AFC estimates that 55,000 cubic yards of soil will be cut and 60,000 cubic yards of material will be filled. After the site is leveled, the power generation equipment will be supported by concrete mat foundations built at grade level (LPGP 1998a).

ELECTRIC TRANSMISSION LINE ROUTE(S)

The proposed route for the electric transmission line is about 14.2 miles long and about 12.1 miles would parallel existing transmission lines. The route crosses about 2.6 miles of land that has been modified by oilfield activity and about 3.5 miles of irrigated agricultural land. Most of the route is accessible from existing roads. Six known cultural resource sites and ten isolates have been found within one quarter mile of proposed Route 1. In some portions of the alternative transmission routes, unknown cultural resources could be present below the surface and could be unexpectedly impacted by construction (LPGP 1998a; 1998e).

The transmission lines will be strung on tubular steel poles and the spans between poles would average about 800 feet and could extend up to a maximum of 1,000 feet. Construction of foundations for the transmission structures will require drilling into the soil to variable depths for each power pole. The depth of soil disturbance will depend on the height and diameter of the individual transmission poles designed for each portion of the route. The width and extent of surface soil disturbance would depend upon the size of equipment needed to set and erect the poles and the amount of construction work that can be accomplished from existing, disturbed areas or roads.

WATER SUPPLY

Of the two alternative raw water supply routes discussed in the AFC, one was withdrawn. The remaining pipeline route, Route 2, is 8.6 miles long and a 20 inch pipe would be buried in a trench three feet wide by seven feet deep. Trenching for the water pipeline would likely result in some disturbance to the previously recorded railroad berm (record updated for this project) and the newly recorded historic trash scatter associated with the railroad berm. The BLM, with the concurrence of the SHPO, has previously determined that the railroad berm and the trash scatter were not eligible for listing in the National Register because the sites lack integrity (LPGP 1998a; 1998e).

The 9,000-foot route for the 6-inch potable water pipeline (Route 4) is located in an area where the only recorded cultural resource is a historic-era trash scatter that has already been disturbed and determined not eligible for the National Register. The area along the pipeline route has been disturbed by road construction and oil field development and impacts to cultural resource are not expected to occur (LPGP 1998a).

NATURAL GAS SUPPLY PIPELINE ROUTES

The 20-inch gas pipeline will be buried with trench approximately two feet wide by six feet deep. However, the trench will be constructed in an area that has been previously disturbed by oil field development and no impacts to cultural resources are expected (LPGP 1998a; 1998e).

CUMULATIVE IMPACTS

The total area affected by the proposed project appears small in comparison to the vastness of the southern San Joaquin Valley. However, the Energy Commission is currently reviewing, or anticipates receiving for review, at least five large power generation projects, all proposed for construction in this part of southwestern Kern County. Such proposed developments, in conjunction with ongoing oil field and agricultural development, are reaching wider and deeper into the southern San Joaquin Valley. The combined effects of this development can accelerate the potential for continued disturbance of cultural resource sites and the loss of significant information. The level of cumulative impact will grow as increasing development opens more undisturbed areas and eventually exposes highly sensitive cultural resource sites. There is increasing potential that important resources will be inadvertently lost or destroyed. Implementation of appropriate mitigation measures is essential to the protection of valuable cultural resources and for the recovery of information on earlier climate patterns and human adaptations to these environmental conditions.

FACILITY CLOSURE

PLANNED CLOSURE

The anticipated lifetime of the LPGP project is expected to be at least thirty-five years. It is anticipated that upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned, orderly closure that will occur when the plant becomes economically non-competitive.

At the time of closure, all then-applicable LORS will be identified and the Energy Commission-required closure plan will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are more likely to depend upon the final location of project structures in relation to existing resources, and then upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no conclusion can be drawn at this time with respect to the impact of facility closure on cultural resources.

UNEXPECTED TEMPORARY CLOSURE

According to the AFC, an emergency unplanned closure, would probably be temporary. The applicant's plan, if this type of closure occurs, would be to keep

everything ready to start-up as soon as the emergency is over. In this sort of situation, there is unlikely to be any impact to cultural resources (LPGP 1998a).

UNEXPECTED PERMANENT CLOSURE

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance of known and / or previously unknown, cultural resources might result.

MITIGATION

The AFC indicates that several historical and prehistoric sites and numerous isolates have previously been found on the surface within one quarter mile of the project area. Since project development and construction usually entail disturbance of the ground surface, as well as disturbance below the surface, the proposed project has the potential for sub-surface excavation to encounter sub-surface cultural resources. The presence of cultural resource materials beneath the surface of the project area is difficult to determine until the ground is opened by excavation, trenching, or augering, so the extent of potential impacts often cannot easily be evaluated prior to construction.

The preferred mitigation for impacts to cultural resources is avoidance. If previously unknown cultural resources are encountered during site clearance and preparation, or during project construction, and they cannot be avoided, then contingency measures must be in place to protect these resources. Staff's objective is to ensure that there will be no adverse impacts to significant cultural resources during project development and construction. Critical to the success of any mitigation effort is the selection of a qualified professional cultural resources specialist. This designated specialist must have the authority to halt or redirect work if those artifacts are located. Commission staff must review the qualifications and approve of the professional archaeologist designated by the project owner to lead and participate in project monitoring and mitigation efforts.

Mitigation measures are developed to reduce the potential for adverse project impacts on the project region's cultural resources to a less than significant level. Staff has recommended a series of conditions of certification that would help ensure the mitigation of project impacts. The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources, in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the US Secretary of Interior guidelines, and Commission staff recommendations. All of these mitigation measures have previously proven successful in protecting sensitive cultural resources from construction-related impacts, while allowing the timely completion of many projects throughout California.

APPLICANT'S PROPOSED MITIGATION

As indicated in the AFC, known cultural resource sites will be avoided wherever possible. The AFC recommends that sites for which significance has not been

formally assessed, will be presumed to be important / significant until such a determination can be made. The applicant has assumed that all the recorded sites that have not yet been formally evaluated for significance/importance and that may still retain integrity, are at minimum an "important" resource under CEQA, or are potentially eligible for listing on the National Register under 36 CFR 60.4(d).

The AFC also recommends a six-point program of mitigation measures that would apply to any cultural resources discovered within the project APE. These proposed mitigation measures will be more fully represented in the conditions of certification. Basically, the six-point program set forth in the AFC includes:

- Avoidance
- Physical Demarcation and Protection
- Crew Education
- Archaeological Monitoring
- Native American Monitoring
- Formal Compliance with CEQA Appendix K/Section 106 (LPGP 1998a,).

STAFF'S PROPOSED MITIGATION MEASURES

Commission staff concurs with the mitigation measures proposed by the applicant in the AFC. Staff has suggested additional language to clarify the measures presented by the applicant. In addition to the applicant's proposed mitigation, staff's recommendation is incorporated into a series of conditions of certification that would reduce the potential for adverse project impacts on the region's cultural resources to a less than significant level.

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the US Secretary of Interior's guidelines, staff's recommendations, and any pertinent policies and guidelines of Kern County. The mitigation measures set forth in the conditions have been applied to all previous project before the Commission and they have proven successful in protecting sensitive cultural resources from construction-related impacts, while allowing the timely completion of many projects throughout California.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

As discussed in the AFC, there are a total of 31 recorded cultural resource sites or isolates within one quarter mile of the project area. The presence of isolates on the surface can sometimes indicate the presence of additional resources below the surface. Since several prehistoric sites and isolates have been recorded within the project area, there is a possibility that project construction could encounter potentially significant cultural resources.

Most of the previously recorded resources have been determined not to be eligible for the National Register of Historic Places. However, one area, located between MP 9.5 and MP 14.2 of the transmission line route, contains a site that previous cultural resource specialists have suggested as potentially eligible to the National Register. Additional testing would need to be conducted to complete the determination of eligibility. Specifically, the AFC suggests that excavation, by means of auger and/or backhoe, could be used to rapidly assess the presence or absence of cultural resources at this location. The AFC also notes that the site is located in a frequently plowed area and concludes that construction-related activity on the surface is unlikely to result in new physical impacts to the resources at this site. But the AFC does recommend that any excavation in this area should be closely monitored (LPGP 1998a; 1998e).

Under recently adopted changes to CEQA, staff is now required to make findings as to the presence of historic resources in the area potentially affected by a project and to draw conclusions as to the potential significance of the resource and/or the impact. Staff is in the process of developing the format in which such determinations are to be made and will address its recommendations in supplemental testimony to be presented at the hearings on this project application.

Generally, the cultural resource conditions of certification proposed by Energy Commission staff are presented as a means of anticipating potential impacts and providing mitigation procedures to prevent impacts to significant cultural resources. If the proposed conditions are implemented by qualified professionals in a timely and proper manner, the project will be in compliance with the applicable LORS.

RECOMMENDATIONS

Staff recommends that the Energy Commission adopt the following proposed conditions of certification, to ensure mitigation of potential impacts to sensitive cultural resources during the construction of the La Paloma Generating Project.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of project construction (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall provide the California Energy Commission (Commission) Compliance Project Manager (CPM) with the name(s) and resume(s) for its designated cultural resource specialist and any other team members who would be assisting the specialist in project monitoring and mitigation.

Protocol: 1) The resume for the designated cultural resource specialist shall include all information needed to demonstrate that the specialist meets the minimum qualifications specified in the US Secretary of Interior Guidelines, as published by the State Office of Historic Preservation (1983). The Commission staff expects that these minimum qualifications would include the following: a graduate degree in

anthropology, archaeology, California history, cultural resource management, or other comparable fields; at least three years of archaeological resource mitigation and field experience in California; and at least one year's experience in each of the following areas: leading archaeological resource field surveys; leading site and artifact mapping, recording, and recovery operations; marshalling and use of equipment necessary for cultural resource recovery and testing; preparing recovered materials for analysis and identification; determining the need for appropriate sampling and/or testing in the field and in the lab; directing the analyses of mapped and recovered artifacts; completing the identification and inventory of recovered cultural resource materials; and the preparation of appropriate reports to be filed with the receiving curation repository, the SHPO, all appropriate regional archaeological information center(s), and the CPM.

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

Verification: At least ninety (90) days prior to the start of construction on the project, the project owner shall submit the names and resumes for its designated cultural resource specialist and the specialist's team members, to the CPM for review and written approval.

At least ten (10) days prior to the termination or release of a designated cultural resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated cultural resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

CUL-2 Project construction shall not begin until the designated cultural resources specialist approved by the Commission CPM is available to be on site. The designated cultural resources specialist shall be responsible for the implementation all the Conditions of Certification and for using qualified personnel to assist him or her in project-related activities. The designated specialist, with assistance from qualified team members as needed, shall conduct the following activities:

- any final pre-construction surveys, flagging of areas to be avoided, and identification of areas where shovel testing, test pits, or backhoe trenching need to be done;
-
- preparation and implementation of the Cultural Resource Monitoring and Mitigation Plan;
-

- preparation and presentation of the pre-construction employee awareness training program;
- maintenance of a daily log of cultural resource monitoring and mitigation activities and preparation of a summary of these activities to be included in the weekly construction status report filed with the CPM;
- direction and implementation of monitoring and mitigation procedures, as needed in sensitive resource areas, during any construction activities associated with all aspects of the project;
- implementation of measures to map, record, sample, and collect sensitive and diagnostic cultural resources;
- preparation and analyses of all data and cultural materials recovered during project monitoring and mitigation;
- identification and inventory of recovered cultural resources;
- preparation of recovered cultural resources for curation in a qualified public repository;
- delivery of recovered cultural materials to the curation institution; and
- preparation of the preliminary and final cultural resource reports to be filed with the receiving curation repository, appropriate regional information center(s), the SHPO, and the CPM.

Verification: At least ten days (10) prior to the start of construction, the project owner shall confirm to the CPM that the approved designated cultural resource specialist is available and prepared to implement the cultural resource Conditions of Certification at the start of construction.

CUL-3 Prior to the start of project construction, the project owner shall provide the designated cultural resource specialist and the CPM with maps and drawings showing the final project design and site layout, and the final alignment of all linear facilities. The routes for the linear facilities shall be provided on 7.5 minute quad maps, showing post mile markers (including "tic marks" for tenths of a mile), final center lines and right-of-way boundaries, and the location of all the various areas where surface disturbance may be associated with project-related access roads, storage yards, laydown sites, pull sites, pump or pressure stations, switchyards, electrical tower or pole footings, and any other project components.

Protocol: The designated cultural resource specialist may request, and the project owner shall provide, enlargements of portions of the 7.5 minute maps presented as a sequence of strip maps for the linear facility routes. The strip maps would include

post mile and tenth of a mile markers and show the detailed locations of proposed access roads, storage or laydown sites, tower or pole footings, and any other areas of disturbance associated with the construction and maintenance of project-related linear facilities. The project owner shall also provide copies of any such enlargements to the CPM at the same time as they are provided to the specialist.

Verification: At least seventy-five (75) days prior to the start of construction on the project, the project owner shall provide the designated cultural resource specialist and the CPM with final drawings and site layouts for all project facilities and maps at appropriate scale(s) for all areas potentially affected by project construction. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall also provide a set of these maps to the CPM at the same time as they are provided to the specialist.

CUL-4 Prior to the start of project construction the project owner shall submit to the CPM for review and approval, a draft Cultural Resources Monitoring and Mitigation Plan, prepared by the designated Cultural Resources Specialist, the designated cultural resources specialist shall prepare, and the project owner submit to the CPM for review and written approval a draft Cultural Resource Monitoring and Mitigation Plan identifying general and specific measures to minimize potential impacts to sensitive cultural resources. For those portions of the project located on lands managed by the US BLM, this plan shall be consistent with BLM requirements for an Archaeological Resources Treatment Plan. After the project owner receives written CPM approval of the plan, the project owner shall make the designated cultural resource specialist and designated cultural resource team available to implement the Monitoring and Mitigation Plan, as needed throughout project construction.

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

a. A proposed research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the post-construction analysis of recovered data and materials.

b. A discussion of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project.

c. A discussion of the mitigation team leadership and organizational structure, and the inter-relationship of team roles and responsibilities associated with completion of the tasks identified in (b), above.

d. A discussion of the need for Native American observers or monitors, the procedures to be used to select them, the areas or post-mile sections where they will be needed, and their role and responsibilities.

e. A discussion of measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

f. A discussion of where monitoring of project construction activities is deemed necessary by the designated cultural resource specialist. The specialist will determine the size or extent of the areas where monitoring is to occur and will establish a schedule for the monitor(s) to be present. If the designated specialist determines that the likelihood of encountering cultural resources in certain areas is slight, the specialist may discontinue monitoring in that location.

g. A description of a set of reporting procedures, prepared in concert with the project owner, to be used by all project personnel to notify the designated cultural resource specialist of any unexpected finds of cultural resources during construction-related activities.

h. A description of the work curtailment procedures, prepared in concert with the project owner, to be followed if cultural resources are unexpectedly discovered during project construction.

i. A discussion of the pre-construction assessment, data recovery, and mitigation procedures to be implemented by the designated cultural resource specialist in the vicinity of known site P-15-004014/CA-KER-4013 if transmission line construction activity may extend below the plow zone. Mechanical excavation may be used for more rapid determination of the presence or absence of cultural resources.

j. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum that meets the US Secretary of Interior standards and requirements for the curation of cultural resources.

k. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.

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

Verification: At least forty-five (45) days prior to the start of construction on the project, the project owner shall provide the draft Cultural Resources Monitoring and Mitigation Plan prepared by the designated cultural resource specialist, to the CPM for review and written approval. If the CPM does not approve the draft plan, the project owner, the designated cultural resources specialist, and the CPM shall meet to discuss comments and work out necessary changes.

CUL-5 Prior to the start of project construction, the designated cultural resources specialist shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and written approval.

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

The training program shall also include the set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program will be presented by the designated cultural resource specialist or qualified individual(s) approved by the CPM and may be combined with other training programs prepared for biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least forty-five (45) days prior to the start of construction on the project, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction. The project owner shall provide the name and resume of individual(s) presenting the training.

The CPM shall provide the project owner with written approval or disapproval of the employee training program, the set of reporting procedures, and the work curtailment procedures. If the CPM does not approve the draft employee training program, the project owner, the designated cultural resources specialist, and the CPM shall meet to discuss comments and work out necessary changes.

CUL-6 Prior to the start of construction and throughout the project construction period as needed for all new employees, the project owner shall ensure that designated cultural resource specialist provides the CPM-approved

training to all project managers, construction supervisors, and workers. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance.

Verification: The project owner shall provide the CPM with documentation in the Monthly Compliance Report, that the designated cultural resource specialist has presented the employee training program and has provided the set of procedures to all project managers, construction supervisors, and all workers.

CUL-7 The designated cultural resource specialist shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered during project-related grading, augering, excavation and/or trenching. The halting or redirection of construction shall remain in effect until the designated cultural resources specialist has notified the CPM of the find and the work stoppage, and until any necessary data recovery and mitigation has been completed. After construction is halted or redirected, the designated cultural resources specialist shall act in accordance with the following procedures:

- The designated cultural resources specialist, representatives of the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

- If data recovery or other mitigation measures are required, the designated cultural resource specialist and team members shall monitor construction activities and implement data recovery and mitigation measures, as needed.

    - All necessary and required data recovery and mitigation shall be completed as expeditiously as possible after discovery of any previously unknown cultural resources, unless additional time is agreed to by all parties.

Verification: Thirty (30) days prior to the start of construction, the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist has the authority to halt construction activities in the vicinity of a cultural resource find.

CUL-8 Throughout the project construction period, the project owner shall provide the designated cultural resource specialist and the CPM with a current schedule of anticipated monthly project activity (presented on a week-by-week basis) and a map indicating the area(s) where construction activities will occur. The designated cultural resources specialist shall consult daily

with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Verification: The project owner shall provide the designated cultural resource specialist and the CPM with a week-by-week schedule of the upcoming construction activities, one month in advance, as well as maps showing where the construction activity is scheduled to take place. These advance schedules are to be provided to the CPM with the Monthly Compliance Report.

CUL-9 Throughout the pre-construction reconnaissance surveys and the construction monitoring and mitigation phases of the project, the designated cultural resources specialist shall keep a daily log of any resource finds and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The designated specialist shall prepare a weekly summary report on the progress or status of cultural resource-related activities. The weekly summary reports are to be filed with the project owner for inclusion in the Monthly Compliance Report to the CPM. The designated resource specialist may informally discuss the cultural resource monitoring and mitigation activities with Commission technical staff.

Verification: Throughout the project construction period, the project owner shall include in the Monthly Compliance Reports to the CPM, copies of the weekly summary reports prepared by the designated cultural resource specialist on the progress or status of cultural resource monitoring and mitigation activities.

CUL-10 The designated cultural resource specialist shall be present at all times to monitor construction-related grading, excavation, trenching, and/or augering in the vicinity of previously recorded archaeological sites and in areas where cultural resources have been identified during project construction.

Protocol: If the designated cultural resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner of the changes. The designated cultural resource specialist shall use mile post markers and boundary stakes placed by the project owner to identify areas where monitoring is being reduced or is no longer deemed necessary.

The daily logs prepared by the designated cultural resource specialist shall indicate by tenths of a post mile, where and when monitoring has taken place and where monitoring has been deemed unnecessary.

Verification: The project owner shall include in the Monthly Compliance Reports to the CPM, copies of the weekly summary reports

prepared by the designated cultural resource specialist on project-related cultural resource activities.

CUL-11 The project owner shall ensure the recovery, preparation for analysis, analysis, and preparation for curation of all cultural resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the museum(s), university(ies), or other appropriate research specialists which will ensure the necessary recovery, preparation for analysis, and analysis of cultural resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of at least five years after completion of the Final Cultural Resources Report and the files shall be kept available for periodic audit by the CPM.

CUL-12 The project owner shall ensure preparation of a Preliminary Cultural Resource Report following completion of data recovery and site mitigation work. The preliminary report is to be prepared by the designated cultural resource specialist and the project owner shall submit the preliminary report to the CPM for review, comment, and written approval.

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

If no cultural resource materials were recovered during project construction, the CPM-approved Preliminary Cultural Resource Report shall also serve as the final report and shall be filed with appropriate entities, as described in conditions CUL-13 and CUL-14, below.

Verification: The designated cultural resources specialist shall prepare a preliminary report on the cultural resource monitoring and mitigation activities conducted for the project. The report shall be prepared within ninety (90) days following completion of the data recovery and site mitigation work. Within seven (7) day after completion of the report, the project owner shall submit a copy of the Preliminary Cultural Resource Report to the CPM for review, comment, and written approval.

CUL-13 The project owner shall ensure the preparation of a Final Cultural Resource Report by the designated cultural resources specialist, if significant or diagnostic cultural resources are found. The Final Cultural Resource Report shall be completed within ninety (90) days following completion of the analysis of the recovered cultural materials and related information.

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

Verification: The Final Cultural Resource Report shall be prepared by the designated cultural resources specialist for the project, within ninety (90) days following completion of the analysis of the recovered cultural materials and preparation of related text, maps, tables, charts, photos, etc. Within seven (7) days after completion of the report, the project owner shall submit a copy of the Final Cultural Resources Report to the CPM for review and approval.

CUL-14 The project owner shall submit an original, an original-quality copy, or a computer disc copy of the CPM-approved Final Cultural Resource Report to the public institution receiving the recovered data and materials for curation, to the SHPO, and to the appropriate regional archaeological information center(s). If the final report is submitted to these entities on a computer disc, the disc files must meet SHPO requirements for format and content. A legible copy of the approved final report shall be filed with the Commission CPM, with a request for confidentiality, if needed to protect any sensitive resources or sites.

Protocol: The copies of the Final Cultural Resource Report to be sent to the curating institution, the SHPO, and the regional information center(s) shall include the following (as applicable to the project findings set forth in the final report): clean and reproducible original copies of all text; originals of any topographic maps showing site and resource locations; original or clear copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys, during project-related monitoring, data recovery, and mitigation; and photographs of the site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curating institution with a set of negatives for all of these photographs.

Verification: The project owner shall maintain in its compliance files, copies of all documentation related to the filing of the original materials and the Commission-approved Final Cultural Resources Report with the public institution receiving the recovered data and materials for curation, the SHPO, and the appropriate archaeological information center(s). If no significant cultural resources were recovered, then the preliminary report shall serve as the final report and copies of the preliminary report shall be filed with these same agencies.

CUL-15 Following the filing of the CPM-approved Final Cultural Resource Report with the appropriate entities, the project owner shall deliver for curation all cultural resource materials, maps and data collected during data recovery and mitigation for the project. The materials shall be delivered for curation into a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources.

Verification: All recovered cultural resource materials shall be delivered for curation within thirty (30) days following the filing of the CPM-approved Final Cultural Resource Report. The project owner shall maintain in its project history or compliance files, copies of signed contracts or agreements with the museum(s), university(ies), or other appropriate public repository(ies) to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

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SOCIOECONOMICS

Testimony of Dale Edwards

INTRODUCTION

A California Energy Commission (Energy Commission) staff socioeconomic impact analysis generally evaluates the project induced changes on community services and/or infrastructure and related community issues such as environmental justice and facility closure. Cumulative impacts are also included. This analysis discusses the potential impacts of the proposed La Paloma project on local communities, community resources, and public services, pursuant to Title 14, California Code of Regulations, Section 15131.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The following LORS are applicable to the La Paloma Generating Company, LLC (La Paloma) project:

FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations." This order focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission. The order requires the US Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this problem. Agencies are required to identify and address any disproportionately high and/or adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations. The Energy Commission receives federal funds and is thus subject to this Executive Order.

STATE

CALIFORNIA GOVERNMENT CODE, SECTIONS 53080, 65959 ET SEQ.

The code includes provisions for levies against development projects near school districts. The administering agency for the above authority for this project is Kern County.

CALIFORNIA GOVERNMENT CODE, SECTION 65996

As amended by SB 50 (Ch. 407, Sec. 23), states that public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

LOCAL

KERN COUNTY GENERAL PLAN

Public facilities component pertinent to socioeconomics.

POLICY NO. 8

In evaluating a development application, Kern County will consider impacts on the local school districts.

IMPLEMENTATION E

Requires the determination of the local cost of facility and infrastructure improvements and expansions that are necessitated by new development of any type and requires the preparation of a schedule of charges to be levied on the developer at the time of approval of the Final Map.

SETTING

The La Paloma project is located in the rural oil fields of western Kern County. For a full description of the socioeconomic setting, please refer to the project description and location (3.0) in the La Paloma AFC, Vol. I., July 1998 (La Paloma 1998). The study area (affected area), defined by La Paloma in the socioeconomics section of the AFC, includes: western Kern County, Bakersfield, Buttonwillow, Maricopa, McFarland, McKittrick, Taft, Shafter, Wasco, and the unincorporated areas of Fellows, Ford City, and Derby Acres. These communities represent all of the communities, within a two-hour, one-way commute distance of the power plant site in which construction and operations workers may live.

IMPACTS

Staff reviewed the La Paloma AFC, Vol. I, July 1998, socioeconomic section (La Paloma 1998) regarding potential impacts to community services and infrastructure (i.e., employment, housing, schools, utilities, emergency and other services), and environmental justice. Based on its independent review, and the fact that data provided in the socioeconomic section of the AFC was provided by and is referenced to governmental agencies and trade associations, staff finds the AFC's socioeconomic analysis and conclusions to be acceptable.

EMPLOYMENT

The analytical tools (gravity and input-output models) used in the AFC by La Paloma to estimate impacts from the La Paloma project on the affected area are widely used and are acceptable to staff. Gravity models relate to incoming population (non-local population) and answer the question of where people will likely live. The gravity model assumes that the attractiveness of a community (whether for shopping or as a place to live) increases with the size of the community (at least for smaller communities) and decreases with the distance that must be traveled to get to the community (Siegler 1979). The results of the gravity model, as

presented by La Paloma in the AFC, are that 66 percent of the non-local construction workers (approximately 69 workers at peak construction) are expected to live in Bakersfield. This is a result that staff would expect because more amenities are available in Bakersfield when compared to the communities closer to the project site. The model further indicates that approximately 22 percent or 23 workers will likely live in Taft or Maricopa, 11 percent or about 12 workers will likely live in Shafter or Wasco; and about one worker will live in Buttonwillow.

The Impact Analysis For Planning (IMPLAN) model is a common regional economic tool used by The University of California at Berkeley. La Paloma has used this tool to assess other generating projects in the area and it is a common regional economic tool. In general, most multipliers are estimated by showing the total change divided by the initial change. Employment multipliers refer to the total additional employment stimulated by the new activity. IMPLAN, a type of input-output model is a disaggregated type of model which divides the (regional) economy into sectors and provides a multiplier for each sector (Lewis et al. 1979). It was appropriate for La Paloma to use a gravity model to distribute the incoming non-local population, and then an input-output model (IMPLAN) to estimate the overall employment resulting from the project. The employment multipliers used by La Paloma (3.23 for construction and 2.88 for operations) are within an acceptable range of 2 often cited by many economists. The 2.88 multiplier for operations is based on a large electrical facility, the Midway Sunset power plant, in Kern County (Smith 1999).

The peak of construction, when the highest number of workers will be needed, is expected to occur in the 15th through 20th months of construction. The greatest number of construction workers, estimated to be 747 workers, will be needed in the 18th month of construction. Approximately 642 of these workers are expected to come from the communities in the affected area (within a two-hour commute radius), and approximately 105 are expected to relocate from communities outside of the two-hour commute radius.

The number of construction workers needed outside of the peak construction period will range from fewer than 100 in the first four months of construction to approximately 519 workers in the 21st month of construction. The average number of non-local workers needed for power plant construction will be 55; 66 for power plant and transmission line construction. During operation of the project, about 35 workers will be needed to maintain and operate the project. Approximately 15 of these operations workers may be non-local.

HOUSING

As of January 1997, approximately 79,572 housing units existed in Bakersfield, 3,311 in Shafter, 4402 in Wasco, 2,418 in Taft, 1,583 in McFarland, and 453 in Maricopa. There are approximately 91,739 total housing units within a two-hour commute, represented by these communities. The vacancy rate for this housing averages approximately five percent. Therefore, approximately 4,587 single-family, multi-family and mobil homes are generally available. In addition, there are approximately 5,760 total motel/hotel rooms in those same communities, with the

availability being about 30 percent on average or 1728 rooms. The combination of housing and motel/hotel rooms likely available to non-local construction and operations workers for this project is more than sufficient for worker needs.

SCHOOLS

Based on 55 average non-local construction workers, 50 school-aged children, not 42[1] as it appears in the La Paloma AFC, and 14 school-aged children for plant operation will be added to the affected area schools. Based on the results of La Paloma's use of a gravity model, most project-related school children are expected to enter Bakersfield schools at the K-8 grade level. According to Table 5.10-6 in the AFC, schools in the Bakersfield City School District and Kern High School District are generally at- or over-capacity. Schools in western Kern County, closer to the project site, appear to be well below capacity in most cases. The addition of project-related children to schools that are at- or over-capacity may increase costs in terms of supplies, equipment and/or teachers. However, according to Senate Bill 50, signed by Governor Wilson on August 27, 1998, which amended section 17620 of the Education code, school funding is restricted to property taxes and statutory facility fees collected at the time the building permit is acquired ($0.31 per square foot of covered or enclosed space). Public agencies may not impose fees, charges or other financial requirements to offset the cost for "school facilities." School facilities are defined as "any school-related consideration relating to a school district's ability to accommodate enrollment."

The life of the La Paloma power plant is estimated by La Paloma in the AFC to be 35 years. Property taxes on the plant have been estimated to be $50,988,000 in the first 10 years with approximately 61 percent (Barnett 1998) earmarked for education (at 1.2 percent of the estimated $500 million capital cost) according to the La Paloma AFC. The net present value of the estimated property taxes cited above at 5.29 percent, the 30-year long-term treasury yield (as of 11/17/98) is $38,822,985. The total employment, estimated by La Paloma, using an IMPLAN model, is the equivalent of 1,457 jobs (includes 1,006 secondary jobs), based on an average of 451 project-related construction jobs and a multiplier of 3.23. For project operations, an average of 35 jobs with an IMPLAN multiplier of 2.88 results in an equivalent of 101 total jobs (includes 66 secondary jobs).

It should be noted that in the La Paloma AFC, the Kern County Superintendent of Schools is quoted as saying, "the project will not have a significant environmental effect in the area of school facilities" (La Paloma 1998). The person who provided that quote, Mr. Steven Hartsell, is the Director of School District Facility Services, under the Superintendent of Schools. Per Mr. Hartsell, recent legislation precludes local and state agencies from imposing fees or other required payments on development projects for the purpose of mitigating possible enrollment impacts to schools (Hartsell 1999).

[1] Miscalculation in AFC at 5.10.2.5

UTILITIES, EMERGENCY AND OTHER SERVICES

The West Kern Water District can meet the project's water supply needs within their existing capacity, PG&E will provide electricity during project construction, and Kern River Gas Transmission Company is the natural gas provider. The project is not expected to place significant demands on the Kern County Fire Department or the Westside District Hospital, during construction or operation.

FINANCIAL

La Paloma estimates (La Paloma 1998, p. 5.10-19) that the construction payroll will be $146 million (1998 dollars) for 22-24 months, and the operation payroll will be $6 million (1998) dollars for 35 years, the bulk of which will be spent in the affected area communities. La Paloma estimates that $42 to $43 million worth of materials and equipment will be purchased locally during construction and that about $6.1 to $7.0 million will be spent locally for operating supplies annually for over 35 years. This spending will generate sales tax revenues for the local jurisdiction (about one percent for the county, and about 6.25 percent for the State, for a total of 7.25 percent).

ENVIRONMENTAL JUSTICE

The EJ screening analysis contained in the AFC (p. 5.10-4) is consistent with the federal EJ guidelines, and the analysis is acceptable to staff. According to the federal EJ guidelines, a minority or low income population exists if the minority or low income population percentage of the affected area is fifty percent of the affected area's general population or greater.

The EJ analysis in the AFC indicates that the affected area's minority population is less than 50 percent. According to the data presented in Table 5.10-2 in the AFC, 31 percent of the affected area population are non-white, based on 1990 US Census Data. More recent minority population data for the total affected area was not available. However, using estimated 1998 minority and total population data for Bakersfield (La Paloma 1998, p. 5.10-2), the growth area of Kern County, staff concludes that the affected area would still fall below the 50 percent threshold, at an estimated 34 percent, to find EJ an issue. In addition, the highest low-income population percentages are for McFarland and Wasco at 27 percent. Therefore, further EJ analysis is not necessary.

CUMULATIVE IMPACTS

Cumulative impacts might occur when more than one project has an overlapping construction schedule that creates a demand for workers that cannot be met by local labor, resulting in an influx of non-local workers and their dependents. At the time of filing of the La Paloma AFC, no other power plant projects were identified in the vicinity of the LPGP. The La Paloma AFC included a discussion of cumulative impacts and concluded that there are none.

Since the La Paloma filing, several other power plant projects in western Kern County have either filed AFCs, or are expected to soon. Sunrise Cogeneration and

Power Project filed an AFC on December 21, 1998, for a 300MW cogeneration project which will be located near the community of Fellows. Elk Hills Power, LLC filed an AFC on February 24, 1999, for a 500MW combined cycle power plant to be located at Elk Hills. AFCs are expected to be filed for the Pastoria and Midway-Sunset projects in April and May 1999, respectively.

SOCIOECONOMICS TABLE 1 shows the estimated number of workers by month for the projected and estimated construction schedules for each of the power plant projects identified above. There are approximately nine months that the five projects will have overlapping construction schedules. During this period, the total number of workers needed for all five projects ranges from approximately 1,400 to over 2000[2]. As of February 1999, the number of unemployed workers in the Kern County labor force was 38,800 out of a total civilian labor force of 277,800 (State of California – Employment Development Department, preliminary data, 1999).

Staff agrees that the LPGP will primarily draw on the local labor force for construction and operation. No significant influx of permanent employee or secondary employment households is expected due to the LPGP because Kern County has a large available labor pool. With the addition of each subsequent project into the construction phase, the ability of the available local labor force to meet project construction needs decreases. The cumulative need for workers in particular crafts or specialties will exceed the availability of workers in those crafts in the local area at different times based on the numbers of specialists available and the total number of specialists needed. Each of the currently filed projects has identified their expectations for local vs. non-local workers based on the available work force by craft and their expectation of worker availability based on other project needs.

La Paloma, likely the first of the five projects to start construction, estimates that 86 and 14 percent of their average worker needs will be supplied by local and non-local workers, respectively. For peak construction, the percentages remain relatively unchanged. Sunrise's estimates are basically the same as La Paloma's. The Elk Hills AFC estimates 80 percent local and 20 percent non-local construction workers for average and peak periods. These expectations for local verses non-local workers are consistent with the availability of general construction laborers and the availability of workers in specific crafts in Kern County. There is sufficient housing available in Bakersfield and other communities closer to the project sites to meet all non-local worker needs.

[2] The number of workers for the Sunrise project's related facilities, such as the gas supply line and electric transmission line, were not available for this analysis.

SOCIOECONOMICS Table 1
Cumulative Construction Workers (Estimated)

	La Paloma	Sunrise*	Elk Hills	Midway-Sunset**	Pastoria**	Total
Year 2000						
Jan	53					53
Feb	76					76
Mar	148	64	111			323
Apr	222	75	128			425
May	304	96	142			542
Jun	403	142	195			740
Jul	467	157	241			865
Aug	555	197	306		72	1,130
Sep	597	233	333	111	140	1,414
Oct	637	241	352	128	210	1,568
Nov	665	255	347	142	289	1,698
Dec	714	237	329	195	382	1,857
Year 2001						
Jan	729	213	317	241	444	1,944
Feb	699	193	310	306	527	2,035
Mar	625	124	231	333	567	1,880
Apr	521	104	158	352	605	1,740
May	399	78	124	347	631	1,579
Jun	195			329	678	1,202
Jul	141			317	692	1,150
Aug				310	664	974
Sep				231	593	824
Oct				158	495	653
Nov				124	379	503
Dec					185	185
Year 2002						
Jan					134	134
Feb						0
Mar						0

* Does not include electric transmission line, gas line and water line workers.

** AFCs not yet filed. The number of workers are estimated, based on generating capacity of the project, compared to the three projects that have filed AFCs.

Based on an average of approximately 1,746 workers during the nine months of overlapping construction for all five projects, and using a multiplier of 3.23, approximately 5,639 secondary jobs are expected to result during that period. Staff does not expect a significant number of these jobs to be filled by non-local workers because these jobs are expected to be temporary, coincident with the construction schedule, and salaries associated with indirect and induced jobs generally do not attract new workers to an area. Over a period of approximately 21 months, secondary jobs, related to the construction of two or more of these projects at the same time, are expected to range from 1,030 to 5,639.

Using a 2.88 multiplier, secondary jobs expected from the operation of the projects range from 127 for two projects to 380 for all five projects (based on 44 employees for two projects and 132 employees, projected plus estimated, for all five projects). These secondary jobs are expected to be filled from the local work force.

Based on an estimated average of 258 non-local workers for all five projects during construction, and assuming the average family size to be 2.91 persons (State of California, Department of Finance 1998), approximately 195 children are expected to be added to Kern County Schools. These children will not enter and leave the schools at the same time, but will enter and leave schools over a period ranging from four to 19 months. During operation of the five projects, approximately 48 children are expected to be added to western Kern County schools as a result of non-local workers relocating their families. The increase in school enrollments due to the five projects during construction will likely cause an impact on those schools in the Bakersfield area that are currently at- or over-capacity. The increase in school enrollments due to the five projects during operation is not expected to cause an impact because these students will likely attend schools in the vicinity of the projects, and these schools are typically under-capacity.

The Kern County Fire Department will provide emergency medical response for the proposed power plants. The Fire Department believes that they have adequate resources to provide emergency medical response for the five power plants that have been identified in this cumulative analysis.

The Kern County Fire Department's fire fighting resources are sufficient to cover all five of the proposed power plant projects. However, the Fire Department has identified a need for one new ladder truck to maintain its current level of service and to effectively respond to the types of emergency incidents that occur at the proposed power plant facilities. Specifically, the Fire Department sees an increase in the number of emergency responses that will require High Angle and Confined Space Specialist Technicians and equipment. The Fire Department requires one new, properly equipped, ladder truck that will be assigned to Station 21 at Taft, and nine new personnel to cover three work shifts per day. Currently, the County has three ladder trucks, two in service and one as a backup. All three trucks are located in the metropolitan Bakersfield area. The closest ladder truck is about 40 miles away from the four power plants proposed for western Kern County. This distance makes dispatching to the area where the power plants are planned unacceptable due to the excessive response time.

The Kern County Fire Department estimates the cost of a new, properly equipped, ladder truck to be $700,000. This cost should be paid by all the projects benefiting from its use. Initially, based on a proration by generation in megawatts, each of the three currently filed power plant projects should make a payment to the Kern County Fire Department as follows: La Paloma, $396,900 (56.7 percent); Sunrise, $114,100 (16.3 percent); and Elk Hills, $189,000 (27 percent).

For the purchase of a replacement ladder truck, approximately 15 years after the purchase of the new ladder truck, the three projects should make annual payments for 15 years to the Kern County Fire Department as follows: La Paloma, $39,690;

Sunrise, $11,410; and Elk Hills, $18,900. These amounts will change as other new projects, subject to this cost sharing, are developed in the area.

For the cost of the nine new personnel to cover three shifts per day, the three projects should make a one-time payment as follows: La Paloma, $425,250; Sunrise, $122,250; and Elk Hills, $202,500.

As new power plant projects in western Kern County are certified by the Energy Commission, they will be required to reimburse the project owners of the La Paloma, Sunrise and Elk Hills projects, based on their share of the above costs as determined by their portion of the total megawatts added to the area. The Kern County Fire Department acknowledges that other new projects, outside the jurisdiction of the Energy Commission, and not necessarily power plants, that benefit from the new ladder truck may also be subject to cost sharing for the above equipment and personnel.

The Kern County Sheriff will provide police service for the five new projects, and existing resources are expected to be adequate to meet law enforcement needs during construction and operation of the five projects. Westside District Hospital serves the area for the five new projects, and their facility is expected to adequately meet medical service needs during construction and operation of the five new projects.

According to the Kern County Fire Department (Chaffin 1999), the Fire Department estimates that their share of the property taxes paid by the four projects expected in the Taft area will be approximately $960,000 per year. This amount is based on the estimated property tax payments described in the AFCs for the La Paloma, Sunrise and Elk Hills projects.

The State Board of Equalization, in a November 13, 1998 issue paper, states that assessment of power generating facilities of 50 megawatts or more should be conducted by the state, using unitary valuation and allocation of revenues on a countywide basis. Board of Equalization staff recommends that implementation of state assessed facilities should be carried out in two phases. Phase 1, which was adopted by the Board on 12/7/98 and commenced on 1/1/99, assesses those companies that have purchased electric generation facilities previously owned by regulated public utilities. Phase 2, which would include all companies producing 50 megawatts or more, is proposed to be adopted on 1/1/2000. Thus, when Phase 2 is implemented, the La Paloma project will most likely be assessed on the unitary tax roll, with revenues from property taxes allocated by formula on a countywide basis with each jurisdiction in the county (cities, school districts, and special districts) receiving a portion of the revenues. A primary difference between state assessment and county assessment is that under county assessment the valuation provisions of Article XIIIA (Proposition 13) apply, including establishing a base year value, a limit of two percent on annual increases, and valuation on the lower of fair market value or adjusted base year value. These provisions do not apply to state assessed property, which is valued annually at fair market value. Therefore, Kern County should expect substantial changes in the allocation of property tax revenues generated by the project and a diminishment of revenues to the County.

FACILITY CLOSURE

PLANNED CLOSURE

La Paloma's AFC provides for the inclusion of socioeconomic LORS which will be incorporated into the facility closure plan when it becomes necessary at the end of the project's economic life. The socioeconomic impacts of facility closure will be evaluated at that time.

UNEXPECTED TEMPORARY CLOSURE

Any unexpected, temporary closure would not likely cause any significant environmental impacts on the affected area, because the likely result of a temporary closure would be reactivation of the power plant by the same or a new owner within a relative short period of time. Personnel changes may occur if there is an ownership change, but socioeconomic impacts would not change significantly because the number of operating personnel would remain relatively the same.

UNEXPECTED PERMANENT CLOSURE

Any unexpected, permanent closure of the La Paloma project would not likely cause any significant environmental impacts on the affected area, because facility closure impacts would be similar to construction impacts, and staff has found no socioeconomic, significant impacts due to the construction of the project.

MITIGATION

La Paloma contends that impacts to schools will be mitigated by the property taxes paid in connection with operation of the proposed project. Staff has determined that, even though a significant cumulative impact has been identified for Kern County schools during the construction period for four power plant projects in western Kern County, including La Paloma, with the changes to the Education Code resulting from the passage of SB 50 in 1998, school funding is now restricted to a combination of property tax revenues and a statutory development fee based on a project's covered or enclosed space.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The estimated gross benefits from the project include increases in the affected area's property and sales taxes, employment, and sales of services, manufactured goods and equipment.

Staff agrees with La Paloma's conclusions in the AFC that the project will not cause a significant adverse impact on the affected area's housing, schools, police, fire, emergency services, hospitals, utilities and employment.

A potential cumulative significant impact on the Kern County Fire Department has been identified. This impact results from the construction and operation of the La Paloma and three other power plant projects in western Kern County (Sunrise, Elk Hills and Midway Sunset). The introduction of the four new power plants in this area reduces the fire department's emergency rescue capabilities below acceptable levels. The owners of the La Paloma project should be required to pay the Kern County Fire Department a share of the cost to bring the fire department's emergency rescue capabilities up to acceptable levels. The Sunrise and Elk Hills projects will also be required to pay a share of the fire department costs. The Midway Sunset project, and any other project in the vicinity certified by the Energy Commission after certification of the La Paloma project, will be required to reimburse the owners of the La Paloma, Sunrise and Elk Hills projects, based on their share of the costs. Should the Sunrise or Elk Hills project not be certified as expected, the dollar amount specified in proposed condition of certification **SOCIO-2** will have to be revised via a staff proposed amendment.

The project, as proposed, is consistent with all applicable socioeconomic LORS. The proposed conditions of certification ensure compliance with LORS, and mitigation of the identified cumulative impact on the Kern County Fire Department.

RECOMMENDATIONS

For the area of socioeconomics, staff recommends that, with the adoption of the following conditions of certification, the La Paloma project be approved.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the statutory development fee as required at the time of filing for the "in-lieu" building permit with the Kern County Department of Engineering and Survey Services and Building Inspection.

Verification: The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

SOCIO-2 The project owner shall:

1) meet with representatives of the Kern County Fire Department, Sunrise Cogeneration and Power Project, and Elk Hills Power Project, within 30 days following the last date of certification for any of these projects, to reach an agreement on funding for the following:

a) purchase of a new 105-foot Pierce Quint Aerial ladder truck equipped for high angle and confined space rescues;

b) a set-aside fund for the purchase of a new replacement ladder truck approximately 15 years from the date of purchase of the truck in a) above; and

c) nine new positions for personnel to cover three shifts per day for the new truck.

Or, if the parties above have not reached an agreement within 90 days of the last date of certification for these projects:

2) The project owner shall make a payment in the amount of $396,900 to the Kern County Fire Department toward the purchase of a new ladder truck, properly equipped per Kern County Fire Department specifications. This payment shall be made within 120 days of the last date of certification for any of the three projects indicated in this condition.

The project owner shall make annual payments for a period of 15 years to the Kern County Fire Department in the amount of $39,690 for the purchase of a replacement ladder truck. This payment shall be made within 120 days of the last date of certification for any of the three projects indicated in this condition.

The project owner shall make a one-time payment to the Kern County Fire Department in the amount of $425,250 for the cost of nine new personnel for one year to cover three shifts per day for the new ladder truck. This payment shall be made within 120 days of the last date of certification for any of the three projects indicated in this condition.

Should the Sunrise and/or Elk Hills projects not be certified by the Energy Commission, the amounts specified in option 2) above will be revised by the Energy Commission to distribute the fire department costs to La Paloma and those projects in the vicinity that have been certified after the La Paloma project.

Verification: The project owner shall provide the CPM with a copy of an agreement with the Kern County Fire Department and the Sunrise and Elk Hills project owners, as described under option 1) above, within 90 days of the last date of Energy Commission certification for the three projects. If no agreement is reached, the project owner shall provide the CPM with proof of payments to the Kern County Fire Department, in the amounts specified under option 2) above, within 90 days of the last date of Energy Commission certification for the three projects. The project owner shall provide proof of annual payments for the replacement ladder truck in the Annual Compliance Report.

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BIOLOGICAL RESOURCES

Testimony of Rick York

INTRODUCTION

This section provides the California Energy Commission staff's analysis of potential impacts to biological resources from the La Paloma Generating Company, LLC, (La Paloma) proposal to construct and operate the La Paloma Generating Project (LPGP). This analysis is directed toward impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological concern. This analysis describes the biological resources of the project site and related facilities. It also determines the need for mitigation, the adequacy of mitigation proposed by the applicant and, where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, on information provided as of March 16, 1999 from the La Paloma Application for Certification (AFC) (LPGP 1998a, AFC section 5.6), biological assessment (LPGP 1998a, Addendum II), addenda to the AFC (LPGP 1998a, Addendum IV, pages 3-10 to 3-15 and LPGP 1998a, Addendum X, pages 1-10), responses to data requests (LPGP 1998a, data responses numbers 16 and 17), supplements (LPGP 1998a, Addendum IX), status reports (LPGP 1999) workshops, site visits, and discussions with various agency representatives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

MIGRATORY BIRD TREATY ACT

Title 16, United States Code, sections 703 through 711, prohibits the take of migratory birds.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code, sections 2050 through 2098, protects California's rare, threatened, and endangered species.

CALIFORNIA CODE OF REGULATIONS

Title 14, California Code of Regulations, sections 670.2 and 670.5, lists animals of California designated as threatened or endangered.

FULLY PROTECTED SPECIES

Fish and Game Code, sections 3511, 4700, 5050, and 5515, prohibits take of plants and animals that are fully protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code, section 1930, designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

STREAMBED ALTERATION AGREEMENT

Fish and Game Code, section 1600, reviews project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code, section 1900 et seq., designates state rare, threatened, and endangered plants.

LOCAL

KERN COUNTY GENERAL PLAN LAND USE, OPEN SPACE, AND CONSERVATION ELEMENTS OF 1994

SECTION 8, RESOURCES

- Policy 14: Habitats of threatened and endangered species should be protected to the greatest extent possible.

KERN COUNTY GENERAL PLAN ENERGY ELEMENT OF 1990

PART 1 - ISSUES, GOALS, POLICIES, AND IMPLEMENTATION

- Policy 12: The County should work closely with local, state, and federal agencies to assure that all projects (both discretionary and ministerial) avoid or minimize direct impacts to fish, wildlife and botanical resources, whenever practical.

- Policy 13: The County should develop and implement measures which result in long-term compensation for wildlife habitat which is unavoidably damaged by energy exploration and development activities.

SETTING

REGIONAL DESCRIPTION

The proposed project site is located in the McKittrick Valley, in the southwestern portion of Kern County. The power plant is to be located 1.9-miles southeast of the community of McKittrick, and about 40-miles west of Bakersfield, California. The proposed power plant site is characterized by a combination of non-native grassland and saltbush scrub. Currently, the McKittrick area is characterized by a combination of oil field development, rural residential, and disturbed/undisturbed native habitats.

Vegetation types found in the project vicinity include alkali sink, non-native grasslands, ruderal, valley saltbush scrub, and perennial and seasonal wetlands. In western Kern County, these vegetation types are habitat for a wide variety of sensitive biological resources including federal and state listed species. Sensitive species such as the San Joaquin kit fox (*Vulpes macrotis mutica)*, giant kangaroo rat (*Dipodomys ingens*), San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), blunt-nosed leopard lizard (*Gambelia sila*), Swainson's hawk (*Buteo swainsoni*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), California jewelflower (*Caulanthus californicus*), Kern mallow (*Eremalche kernensis*), and Hoover's eriastrum (*Eriastrum hooveri*) are found in western Kern County.

SITE VICINITY DESCRIPTION

La Paloma has provided an extensive list of sensitive species that potentially occur in the project area (LPGP 1998a, AFC pages 5.6-5 and 5.6-6, Table 5.6-1). A complete list of plants, wildlife, and natural communities seen during 1998 field surveys can be found in the Biological Assessment, Attachment A (LPGP 1998a, Addendum II).

POWER PLANT SITE

The proposed 23-acre power plant site is comprised of 20.7-acres of non-native grassland and 2.3-acres of valley saltbush scrub habitat characterized by saltbush (*Atriplex* spp). The project site, and surrounding areas, has a history of use by oil development as evidenced by the presence of oil wells on the project site as well as on adjacent parcels. The non-native grassland and saltbush scrub habitat types are habitat for sensitive species such as the blunt-nosed leopard lizard and the San Joaquin kit fox, both federal and state-listed species, and the San Joaquin antelope squirrel, a state-listed species.

POWER PLANT LAYDOWN AREA

A 23.3-acre laydown area will also be temporarily disturbed during power plant construction. The laydown area located immediately adjacent to the proposed power plant site, is comprised of valley saltbush scrub and non-native grassland habitats.

NATURAL GAS SUPPLY PIPELINE CORRIDOR

The proposed 370-foot natural gas supply pipeline corridor contains a small amount of valley saltbush scrub habitat. However, the proposed natural gas pipeline will be located primarily in an existing dirt roadway.

TRANSMISSION LINE CORRIDORS

Two alternative transmission lines, Route 1 and Route 1A, were identified on Map 3.2-1 in the AFC. Route 1 is 13.6-miles long, while Route 1A is 14.2-miles long. The transmission line corridor for both alternative routes is comprised predominantly of valley saltbush scrub habitat, however a small percentage of the corridor includes some valley alkali sink habitat. Valley alkali sink habitat is characterized by native shrub species such as iodine bush (*Allenrolfea occidentalis*) and seepweed (*Suaeda* sp.). Along the transmission line corridors many seasonally wet depressions are also found. These depressions are not classified as vernal pools, however they do contain some vernal pool invertebrate species including fairy shrimp (*Branchinecta* spp.). In addition to these native habitats, approximately one-third of the proposed transmission line corridor will be located in agricultural lands.

The proposed transmission line corridors will parallel an existing transmission line corridor and traverse the Lokern Natural Area. The Lokern Natural Area contains two protected areas, the Lokern Preserve managed by the Center for Natural Lands Management (CNLM), a private conservation organization, and the Lokern Ecological Reserve managed by the California Department of Fish and Game (CDFG). The Lokern Natural Area was first established as a high priority area for a long list of state and federally listed species. Representatives of several public agencies and private landowners, including the California Energy Commission, the Bureau of Land Management (BLM), CDFG, the U. S. Fish and Wildlife Service (USFWS), and CNLM work cooperatively as the Lokern Cooperative Group to protect and manage the publicly and privately owned lands within the Lokern Natural Area. The Energy Commission is a signatory of the Memorandum-of-Understanding developed to help guide the management of the habitat.

POTABLE WATER SUPPLY PIPELINE CORRIDOR

The potable water supply pipeline corridor is approximately 1.5-miles long, and is comprised primarily of valley saltbush scrub habitat and ruderal areas. Ruderal areas experience frequent human disturbance and are dominated by a variety of native and non-native annual plant species.

RAW WATER SUPPLY PIPELINE CORRIDORS

Two possible raw water supply pipeline routes have been identified as Route 2 and Route 3. Route 2, proposed to parallel Highway 58, is 8.7-miles long, will traverse primarily valley saltbush scrub habitat, in addition to some non-native grassland habitat. Raw water supply pipeline Route 3 would parallel transmission line Route 1 (see above), and traverse valley saltbush scrub habitat. Route 3 also would traverse the Lokern Natural Area that includes the Lokern Preserve and the Lokern Ecological Reserve, which are managed by the Center for Natural Lands Management and CDFG, respectively. As with the transmission line corridor, the

proposed raw water pipeline corridor contains many seasonally wet depressions that contain vernal pool invertebrate species such as fairy shrimp (*Branchinecta* spp.). Whichever route is utilized, a turnout at the California Aqueduct will need to be constructed in addition to a new 700,000-gallon water storage tank.

IMPACTS

PROJECT SPECIFIC IMPACTS

In the revised Biological Assessment (LPGP 1998a, Addendum II) Table 5-1 provided a complete summary of the project's temporary and permanent impacts by project component. Table 3-9 of the LPGP Supplement 1 (LPGP 1998a, Addendum IV, pages 3-12 to 3-15 and Addendum X, pages 1-10) provides updated acreages for all biological resource habitat impacts including changes to the raw water supply pipeline and water storage tank. The following table identifies the anticipated project-related acreage impacts.

BIOLOGICAL RESOURCES Table 1
Acreage Impacts

	Permanent Impacts (acres)	Temporary Impacts (acres)
Power plant	23	0
Laydown area	0	23.3
Transmission line (Route 1)	2.32	22.6
Transmission line (Route 1A)	2.32	22.6
Raw water pipeline (Route 2)	0.5	65.0
Raw water pipeline (Route 3)	0.5	62.6
Water storage tank	0.5	0
Potable water pipeline	0	10.9
Natural gas pipeline	0	0.44

When all the preferred alternatives of the various components of the project are considered, it is expected that 27.4-acres of habitat will be permanently impacted and 125.8-acres of habitat will be temporarily impacted. LPGP construction and/or operation may directly impact individuals of the following sensitive species and/or the habitat on which they depend:

BIOLOGICAL RESOURCES Table 2
Sensitive Species

Sensitive Plants	Status*
Lost Hills crownscale (*Atriplex vallicola*)	CNPS List 1B
Recurved larkspur (*Delphinium recurvatum*)	CNPS List 1B
Hoover's eriastrum (*Eriastrum hooveri*)	CNPS List 1B/FT
Tejon poppy (*Eschscholzia lemmonii* ssp. *kernensis*)	CNPS List 1B
Kern mallow (*Eremalche parryi* ssp. *kernensis*)	CNPS List 1B/FE

Sensitive Wildlife	Status
Tricolored blackbird (*Agelaius tricolor*)	SSC
LeConte's thrasher (*Toxostoma lecontei macmillanorum*)	SSC
California condor (*Gymnogyps californianus*)	SE/FE
Golden eagle (*Aquila chrysaetos*)	SC
Swainson's hawk (*Buteo swainsoni*)	ST
Long-eared owl (*Asio otus*)	SSC
Burrowing owl (*Athene cunicularia*)	SSC
Northern harrier (*Circus cyaneus*)	SSC
Yellow warbler (*Dendroica petechia*)	SSC
White-tailed kite (*Elanus caeruleus*)	FP
California horned lark (*Eremophila alpestris actia*)	SSC
Prairie falcon (*Falco mexicanus*)	SSC
Loggerhead shrike (*Lanius ludovicianus*)	SSC
Blunt-nosed leopard lizard (*Gambelia sila*)	SE/FE/FP
San Joaquin coachwhip (*Masticophis flagellum ruddocki*)	SSC
Western spadefoot toad (*Scaphiopus hammondii hammondii*)	SSC
Giant kangaroo rat (*Dipodomys ingens*)	SE/FE
Short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*)	SSC
Tulare grasshopper mouse (*Onychomys torridus tularensis*)	SSC
San Joaquin pocket mouse (*Perognathus inornatus inornatus*)	SSC
San Joaquin antelope squirrel (*Ammospermophilus nelsoni*)	ST
San Joaquin kit fox (*Vulpes macrotis mutica*)	ST/FE
American badger (*Taxidea taxus*)	SSC
Longhorn fairy shrimp (*Branchinecta longiantenna*)	FE
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FE
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FT

* **Status legend:** CNPS List 1B = Plants rare or endangered in California and elsewhere (California Native Plant Society 1994), SSC = Species of Special Concern (CDFG 1992), FE = Federally listed Endangered, FT = Federally listed Threatened, SE = State listed Endangered; ST = State listed Threatened and FP = State Fully Protected.

POWER PLANT SITE AND LAYDOWN AREA

Construction of the power plant will result in the permanent loss of 20.7-acres of non-native grassland habitat and 2.3-acres of saltbush scrub habitat, or a total of 23-acres. During project construction, a 23.3-acre laydown area will be needed. Use of the project laydown area will result in the temporary disturbance of 10-acres of non-native grassland habitat and 13.3-acres of valley saltbush scrub habitat. These habitat types are occupied by blunt-nosed leopard lizards and San Joaquin kit foxes, both federal and state-listed species, and San Joaquin antelope squirrels, a state-listed species. The blunt-nosed leopard lizard is also a Fully Protected species.

TRANSMISSION LINE

Construction of either of the transmission line alternatives [Route 1 (13.6-miles) and Route 1A (14.2-miles)] would result in temporary habitat disturbance, permanent habitat loss, and a potential for impacts to individual species during project construction. There is also the likelihood that individual species will be impacted along access roads that will be used during construction of the transmission line. A variety of sensitive species are found in the region. Blunt-nosed leopard lizards, giant kangaroo rats, Tipton kangaroo rats, San Joaquin kit foxes, San Joaquin ground squirrel, Kern mallow, recurved larkspur, Hoover's eriastrum and other sensitive species are found in both transmission line corridors.

The preferred transmission line corridor (Route 1) will parallel an existing transmission line corridor. Short access roads will be needed during transmission line construction and maintenance activities. Access road development and installation of transmission line towers will permanently impact 2.32-acres of habitat (2.18-acres of valley saltbush scrub and 0.14-acres of alkali sink scrub). A total of 22.6-acres of habitat (21.6-acres of valley saltbush scrub and 1.0-acre of alkali sink scrub) will be temporarily impacted during construction of either transmission line route.

Some seasonally wet depressions may also be temporarily impacted during installation of the transmission line. It is remotely possible that one or more federally listed vernal pool species such as the vernal pool fairy shrimp (*Branchinecta lynchi*, federally-listed Threatened), the longhorn fairy shrimp (*Branchinecta longiantenna*, federally-listed Endangered), and the vernal pool tadpole shrimp (*Lepidurus packardi*, federally-listed Endangered) could occur in the project area (U. S. Fish and Wildlife Service, 1998).

Transmission line Route 1 will cross the CNLM Lokern Preserve and the CDFG Lokern Ecological Reserve as it parallels an existing transmission line corridor. La Paloma is negotiating a Memorandum-of-Understanding with CNLM to obtain an easement so the transmission line can be located on CNLM land and La Paloma can have access to the preserve for required transmission line maintenance activities. Route 1 also crosses the Lokern Natural Area, a planning area established by state and federal agencies, Kern County, and private landowners specifically to work together to decide how best to protect sensitive species habitats in this portion of western Kern County.

For a map of the Lokern Natural Area and other protected areas in the vicinity of the proposed project, see Biological Resources **Figure 1**.

Biological Resources - FIGURE 1

LOKERN NATURAL AREA AND OTHER SENSITIVE AREAS
(Source: Energy Commission Cartography Unit)

Whereas CNLM is willing to negotiate an agreement with La Paloma so the transmission line can cross CNLM land, CDFG regulations do not allow the granting of easements for facilities such as transmission lines in state ecological reserves. A transmission line corridor currently crosses the CDFG Lokern Ecological Reserve, however the corridor was established prior to the establishment of the ecological reserve. State ecological reserves are established principally to protect sensitive species and their habitats, so CDFG must make certain that these areas are not impacted. For this reason, La Paloma intends to avoid the state ecological reserve by rerouting their transmission line around the protected area.

The Energy Commission regulations also states that protected areas should be avoided by energy development. Section 25527 of The Warren-Alquist Act states that protected areas "shall not be approved as a site for an energy facility, unless the commission finds that such use is not inconsistent with the primary uses of such lands and that there will be no substantial adverse environmental effects and the approval of any public agency having ownership or control of such lands is obtained."

Regarding mitigation, La Paloma intends to mitigate all temporary and permanent impacts to CNLM property at higher habitat compensation ratios (2.1:1 for temporary impacts and 4:1 for permanent impacts) since impacts to protected lands are mitigated at higher ratios than impacts to other natural lands. In addition, all LPGP habitat compensation purchases and the associated endowment, will be provided by La Paloma to CNLM, and become part of CNLM's Lokern Preserve within the Lokern Natural Area of western Kern County.

Staff always strives to make certain that all protected areas are avoided when energy development occurs. However, in certain circumstances impacts may be unavoidable, so approvals need to be arranged to allow the impacts to occur and agreed upon mitigation implemented. For this project, La Paloma is able to avoid the CDFG Lokern Ecological Reserve to avoid impacting the protected area. For the Lokern Preserve, La Paloma is able to develop an agreement with CNLM to allow for the construction and maintenance of the transmission line and towers. In addition, La Paloma has agreed to minimize their impacts as much as possible during construction and operation of the new transmission line and more than adequately compensate for any unavoidable temporary and permanent impacts.

Staff feels that the transmission line and towers will not be inconsistent with the primary uses of the CNLM Lokern Preserve, and the proposed habitat compensation mitigation to be provided by La Paloma will be more than adequate to compensate for the project temporary and permanent impacts. As a result, staff is comfortable with the proposed methods for resolving this difficult situation.

WATER SUPPLY PIPELINES

RAW WATER SUPPLY PIPELINE AND WATER STORAGE TANK

Supplying raw water to the power plant for cooling will require the construction of a water supply pipeline that connects the power plant to the California Aqueduct and

a 700,000-gallon water storage tank. As with the transmission line routes, there is an extensive list of sensitive species found within each raw water supply pipeline corridor route. Raw water supply pipeline Route 2 (8.7-miles) would parallel Highway 58, and Route 3 (8.4-miles) would parallel proposed transmission line Route 1.

Permanent and temporary impact acreage amounts for the raw water supply pipeline, the California Aqueduct turnout, and the water storage tank are based upon amounts found in Table 3-9 of Supplement 1 to the Application for Certification (LPGP 1998a, Addendum IV, pages 3-12 to 3-15).

Construction of the Route 2 water supply pipeline will result in the permanent loss of 0.5-acres of valley saltbush scrub habitat at the California Aqueduct turnout site. In addition, construction of the Route 2 water supply pipeline will also result in the temporary disturbance of 65.0-acres (62.6-acres of valley saltbush scrub and 2.9-acres of non-native grassland). Species expected to occur in the Route 2 corridor include a variety of sensitive species including the blunt-nosed leopard lizard, Hoover's eriastrum, recurved delphinium, San Joaquin kit fox, and the San Joaquin ground squirrel.

If Route 3 is utilized, construction of the California Aqueduct turnout will result in the permanent loss of 0.5-acres of valley saltbush scrub habitat. For construction of the entire Route 3 raw water supply pipeline corridor, there would be temporary disturbance of 62.5-acres of valley saltbush scrub habitat. In addition to the species identified for the Route 2 corridor, the giant kangaroo rat would also be expected to occur within the Route 3 corridor.

If Route 3 is utilized, La Paloma will also need to acquire easements from CNLM and CDFG since the pipeline route will cross the CNLM Lokern Preserve and the CDFG Lokern Ecological Reserve. For a more complete discussion of the problems associated with acquiring these easements, see the ***Transmission Line*** section above.

Construction of raw water supply pipeline Route 2 or Route 3 will require the construction of a new 700,000-gallon water storage tank, and result in the permanent loss of 0.5-acres of valley saltbush scrub habitat.

As with the construction of the transmission line, there will be some temporary impacts to some seasonally wet depressions that contain species such as fairy shrimp (*Branchinecta* spp.). It is remotely possible that the vernal pool fairy shrimp (*Branchinecta lynchi*), a federally listed endangered invertebrate species, and other protected invertebrate species (see complete species list in ***Transmission Line*** discussion above) could occur in the project area and, as a result, be impacted by project construction.

A potential biological resource issue associated with the removal of water from the California Aqueduct is the potential impacts to the delta smelt (*Hypomesus transpacificus*), a federally listed Threatened fish species. Since La Paloma is proposing to utilize West Kern Valley Water District "banked" water and not require

an increase in the amount of water withdrawal above the current, permitted West Kern Valley Water District water withdrawal amount, staff concludes that the delta smelt will not be affected by LPGP.

POTABLE WATER SUPPLY PIPELINE

The potable water supply pipeline route is much shorter than either raw water supply pipeline route. The potable water supply pipeline will be 1.5-miles long, and there will not be any permanent loss of habitat associated with the construction, operation or maintenance of the pipeline. However, there will be some temporary disturbance of habitat during construction.

Construction of the potable water supply pipeline will result in the temporary disturbance of 10.9-acres of habitat (7.3-acres of valley saltbush scrub and 3.6-acres of ruderal habitat). Species expected to occur in the region of the potable water supply pipeline are the San Joaquin kit fox, San Joaquin antelope squirrel, and the blunt-nosed leopard lizard. Once the potable water supply pipeline is constructed, no additional impacts are expected as a result of the operation and maintenance of the potable water supply pipeline.

NATURAL GAS PIPELINE

Construction of the 0.07-mile natural gas pipeline will result in temporary impacts to 0.44-acres of valley saltbush scrub habitat. Once the natural gas pipeline is constructed, no impacts are expected during operation and maintenance of the pipeline.

CUMULATIVE IMPACTS

"Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." (California Environmental Quality Act Guidelines, section 15355)

TRANSMISSION LINE

The installation of an additional transmission line in an area where existing transmission lines are known to be causing significant biological resource impacts (e.g., bird collisions with existing transmission lines/towers located within a well established bird migratory flyway) may represent a cumulative impact, and require additional mitigation. The existing transmission line corridor does not currently pose that sort of threat to local biological resources.

However, if the LPGP transmission line is installed within the current transmission line corridor there will be a total of three transmission lines that cross the Lokern Natural Area. Staff is concerned about this ever-widening transmission line corridor since the temporary and permanent impacts associated with transmission line access roads are beginning to diminish the value of the habitat and conflict with the overall goal to protect the habitat in the Lokern area.

Staff is not recommending additional mitigation for cumulative impacts to biological resources by La Paloma because the applicant's mitigation for temporary and permanent impacts is exemplary. La Paloma is proposing to utilize the existing corridor because they do not want to create a new corridor that would result in far larger temporary and permanent impacts. However, new energy project proponents that are considering projects in this portion of western Kern County (e.g. Elk Hills Power Project, Midway-Sunset, and Sunrise Cogeneration and Power Project) need to understand that staff will give careful consideration to requiring additional mitigation for cumulative impacts if any future projects choose to locate their transmission lines within the corridor that currently bisects the Lokern Natural Area.

However, if future projects do choose to utilize the existing corridor that crosses the Lokern Natural Area and ends at the Buttonwillow substation, staff will argue that impacts, as well as mitigation costs, can be significantly minimized by encouraging future applicants to hang any new transmission conductors from existing transmission line towers (such as those constructed for the LPGP transmission line, if it is constructed). Implementation of this strategy will stop the continual widening of the transmission corridor and the need for additional access roads associated with new transmission lines.

FACILITY CLOSURE

Sometime in the future, the LPGP facility will experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an "on-site contingency plan" will be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (See **General Conditions** section in **Facility Closure** and Biological Resources Condition of Certification **BIO-11**).

PLANNED OR UNEXPECTED PERMANENT FACILITY CLOSURE

The region surrounding the proposed project site is a mosaic of disturbed and undisturbed valley saltbush scrub and non-native annual grassland habitats. The undisturbed and disturbed habitats are dominated by native and non-native plant species that provide food and cover for the associated species including several protected plant and wildlife species. Since the proposed project area currently provides habitat for these species, the facility closure plan needs to address habitat restoration measures to be implemented in the event of a planned or an unexpected permanent closure. Habitat restoration measures that should be addressed include such tasks as the removal of all power plant site structures and the immediate implementation of habitat restoration measures to re-establish native habitat types (e.g. valley saltbush scrub). In addition, planned or unexpected permanent facility closure may also trigger the removal of the transmission conductors, and possibly the entire transmission line, since birds are known to collide with transmission conductors.

UNEXPECTED TEMPORARY CLOSURE

Staff does not have any biological resource facility closure recommendations in the event of an unexpected temporary closure of the LPGP facility. However, in the event that the Energy Commission CPM decides that the facility is permanently closed, the above-mentioned facility closure measures need to be given careful consideration.

MITIGATION

La Paloma has developed a mitigation strategy that maximizes the avoidance of impacts to sensitive species and their habitats. Where avoidance is not possible, La Paloma has proposed that a habitat compensation program, for both temporary and permanent impacts, be implemented. In the AFC (LPGP 1998a, AFC pages 5.6-28 to 5.6-39, section 5.6.3 and LPGP 1998a, Addendum II, pages 7-1 to 7-10) La Paloma has provided mitigation strategies for project design and siting, pre-construction, construction, post-construction, operation and maintenance activities. La Paloma's proposed mitigation measures include items such as avoidance of wetlands, designing/building transmission line towers to minimize bird electrocutions, implementing a worker environmental awareness program, designation of a biologist to oversee all biological resource mitigation measures, implementation of sensitive species take avoidance measures, minimizing permanent impacts to habitat, monitoring all activities that could result in incidental take of a sensitive species, implementation of a habitat reclamation plan once temporary habitat disturbance is completed, prohibiting firearms and pets from the project site, minimizing the use of rodenticides and herbicides in the project area, and acquiring compensation lands to satisfy the requirements of state and federal endangered species acts. For a complete list of the mitigation proposed by La Paloma, see Biological Resources Condition of Certification **BIO-1**.

To make certain that all proposed mitigation measures are properly implemented during project construction and operation, La Paloma will inform its workers about the sensitive biological resources in the project region (Worker Environmental Awareness Program) and create a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). The BRMIMP, when finalized prior to the beginning of any project-related habitat disturbance, will identify:

- specific take avoidance measures to protect sensitive species during project construction;
- information about a Worker Environmental Awareness Program that will be implemented during project construction and operation to make certain all workers understand the environmental, and in particular the biological resource sensitivities, of the project;
- specific measures to avoid sensitive species impacts during project operation (e.g. speed limits, no firearms allowed at the project site, and trash control);

- measures to be implemented to rehabilitate temporarily disturbed areas; and

- the amount of habitat compensation, and associated endowment, that will be provided by La Paloma to compensate for permanent and temporary habitat impacts.

For details about the Worker Environmental Awareness Program and the BRMIMP, see Biological Resources Conditions of Certification **BIO-5** and **BIO-9.**

LA PALOMA HABITAT COMPENSATION

To assist in the calculation of the amount of habitat compensation, habitat compensation ratio requirements have been provided by the USFWS and CDFG, and will be utilized by La Paloma. The habitat compensation ratios (number of acres to be purchased per acre impacted) to be utilized by La Paloma are:

Impacts	Compensation Ratio
Permanent impacts to natural lands	3.0:1
Temporary impacts to natural lands	1.1:1
Permanent impacts to protected lands	4.0:1
Temporary impacts to protected lands	2.1:1

Natural lands are defined as any habitat that contains a variety of native and non-native plant species for food and/or cover and are available for wildlife usage. *Protected lands* are defined as those areas, for this particular project, that are currently protected by the Bureau of Land Management, CDFG, and the (CNLM).

As of March 16, 1999, La Paloma has identified that 27.4-acres will be permanently impacted and 125.8-acres will be temporarily impacted by the project. A complete and updated listing of impact acreage amounts can be found in the La Paloma addendum (LPGP 1998a, Addendum IX, Table 3.4-2, pages 3-6 to 3-8).

Based upon expected impact acreage amounts and the application of the habitat compensation ratios mentioned above, La Paloma intends to purchase at least 246.5-acres in the immediate vicinity of the Lokern Preserve within the Lokern Natural Area of western Kern County (LPGP 1998a, Addendum IX). The Lokern Preserve is located approximately 3 air miles north of the proposed power plant site, and contains the same habitat types and sensitive species that will be impacted during LPGP construction. The Lokern Preserve was originally established by The Nature Conservancy in the late 1980's, however it is now owned and managed by CNLM, a private, non-profit organization dedicated to the protection and management of natural resources.

Once the mitigation acreage is purchased, La Paloma will deed the entire acreage to CNLM. Prior to compensation habitat purchase, La Paloma will also work with CNLM to decide on the amount of funds to be provided by La Paloma to CNLM to be used as an endowment for the in perpetuity preservation and management of the compensation habitat. The endowment amount will be determined prior to the

Energy Commission Final Decision. For additional information about habitat compensation, refer to Biological Resources Condition of Certification **BIO-10**.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

To be in compliance with applicable laws, ordinances, regulations and standards, La Paloma must obtain an endangered species take permit and two biological opinions - 1) a Section 7 consultation and resulting Biological Opinion from the USFWS and 2) a Section 2081.1 Biological Opinion and take permit from CDFG. These documents will identify mitigation measures required by each regulatory agency. For further information on these documents, see Biological Resources Conditions of Certification **BIO-6** and **BIO-7**.

In addition, a CDFG Streambed Alteration Agreement will be required for impacts to seasonal watercourses that are associated with construction of the transmission line and raw water supply pipeline. For details about the Streambed Alteration Agreement, see Biological Resources Condition of Certification **BIO-8**.

La Paloma has stated that all jurisdictional wetlands will be avoided, so a U. S. Army Corps of Engineers Section 404 permit will not be required for this project.

To help the project owner comply with laws, ordinances, regulations, and standards and the biological resource mitigation measures associated with this project, La Paloma must designate a biological resource specialist (the Designated Biologist), prior to the beginning of any project-related ground disturbance, who is familiar with the biological resource issues of the project area. The Designated Biologist will help the project owner make certain that all mitigation measures are complied with during project construction and operation. For details about the roles and responsibilities of the Designated Biologist, see Biological Resource Conditions of Certification **BIO-2**, **BIO-3**, and **BIO-4**.

CONCLUSIONS, UNRESOLVED ISSUES AND RECOMMENDATIONS

CONCLUSIONS

Construction and operation of the project will not have significant impacts on local biological resources if adequately mitigated. For those project impacts identified, mitigation measures proposed by the applicant, staff, and federal and state wildlife protection agencies will reduce project impacts to insignificant levels.

Approval of the final BRMIMP will be completed prior to the beginning of project construction. The final BRMIMP will be developed in consultation with the project owner, Energy Commission, USFWS, CDFG, and anyone else interested in participating in a meeting(s) that will be scheduled to finalize the BRMIMP details.

UNRESOLVED ISSUES

BIOLOGICAL OPINIONS

Biological opinions from the USFWS and CDFG have not been received, so final mitigation requirements from these agencies is unknown at this time. However, mitigation suggested by La Paloma in their application and in their draft mitigation and monitoring plan during the siting process has not been rejected by representatives of either agency, so staff expects that when the respective biological opinions are provided that the required mitigation will be easily addressed by La Paloma.

As of March 11, 1999 the USFWS indicated that their biological opinion might be received by mid-April 1999. Once CDFG receives a copy of the federal opinion, CDFG will complete its review and provide its biological opinion and Incidental Take Permit.

FULLY PROTECTED SPECIES

The blunt-nosed leopard lizard (*Gambelia sila*) is listed as an Endangered species by the state and federal governments; it is also listed as a state Fully Protected species (Fish and Game Code 5050). This species is known to occur in the project area, and a variety of mitigation measures (e.g. avoidance and habitat compensation) will be implemented to address potential impacts.

A conflict currently exists between the state regulations that address listed (rare, threatened, and endangered) species and the regulations that address those species that are also "listed" as Fully Protected species. CDFG is not able to allow the take of a Fully Protected species unless it is done as part of scientific research. However, Incidental Take permits can be granted for state listed species. Since the blunt-nosed leopard lizard is on both lists, a problem exists. Even though CDFG knew that this conflict existed it has not moved to correct the problem until just recently.

CDFG fully intends to remedy this situation by implementing legislative changes to the Fish and Game Code, however, the timeframe for final resolution is unknown. As a result, CDFG and the Resources Agency are working on developing a strategy that can provide a temporary solution that can then be used by La Paloma to be in compliance with state regulations. This conflict must be resolved so that staff can state with certainty that the La Paloma project is in compliance with all LORS.

RECOMMENDATIONS

La Paloma needs to complete and provide the following information in order for staff to complete this Biological Resource analysis:

- All information necessary for permits required to be in compliance with the applicable LORS including Fully Protected species;

- Total off-site habitat compensation acreage amount to be provided to the Center for Natural Lands Management (CNLM);

- Total endowment amount for in perpetuity habitat management and protection of the parcels provided by La Paloma to CNLM for the Lokern Preserve; and

- A copy of the letter from CNLM that grants La Paloma permission to construct and maintain the transmission line and towers to be located on the CNLM Lokern Preserve.

Staff also recommends that the Energy Commission committee adopt the following Biological Resources Conditions of Certification.

CONDITIONS OF CERTIFICATION

In addition to the following Conditions of Certification, other conditions may be necessary after Biological Opinions are received from CDFG and the USFWS and La Paloma receives a CDFG Incidental Take Permit. The CDFG Incidental Take Permit will outline the mitigation measures (e.g. sensitive species take avoidance measures and habitat compensation requirements) to be followed by La Paloma prior to and during project construction and operation. See Biological Resource Condition of Certification **BIO-6** for more details about the CDFG permit. The USFWS Biological Opinions will, as will the Incidental Take Permit, provide mitigation requirements that must be followed prior to project construction, and during construction and operation. For more information about the USFWS Biological Opinion, see Biological Resource Conditions of Certification **BIO-7**.

APPLICANT'S MITIGATION

BIO-1 The project owner will implement the following mitigation measures identified in Section 5.6.3.1 found on pages 5.6-28 to 5.6-38 of the LPGP Application for Certification (LPGP 1998a). The project owner's proposed mitigation measures will be incorporated into the final Biological Resources Mitigation Implementation and Monitoring Plan (see Condition of Certification **BIO-9**, below) unless the mitigation measures conflict with mitigation required by the U. S. Fish and Wildlife Service and the California Department of Fish and Game that is contained in their respective Biological Opinions.

The project owner will:

17. Site transmission line poles, access roads, pulling sites, and storage and parking areas to avoid sensitive resources whenever possible.

18. Avoid all wetlands.

19. Design and construct transmission lines and poles to reduce the likelihood of electrocutions of large birds.

20. Bury any pipelines that cross streams and dry creek beds below the scour depth for each waterway. Streambeds disturbed during construction will be recontoured so that drainage patterns are not changed from pre-construction conditions.

21. Implement a Worker Environmental Awareness Program.

22. Hire a qualified biologist, that is acceptable to Energy Commission, USFWS, and CDFG to conduct pre-construction surveys no more than 14 days prior to initiation of construction in any portion of the project area.

23. Implement CDFG approved take avoidance measures for the blunt-nosed leopard lizard.

24. Clearly mark construction area boundaries with stakes, flagging, and/or rope or cord to minimize inadvertent degradation or loss of adjacent habitat during facility construction. All equipment storage will be restricted to designated construction zones or areas that are currently not considered sensitive species habitat.

25. Post signs and/or fence the power plant site and laydown areas to restrict vehicle access to designated areas.

26. Institute traffic restraints and signs to minimize temporary disturbances. A 20-mph speed limit will be implemented on the project site.

27. Designate a specific individual as a contact representative between La Paloma, USFWS, Energy Commission, and CDFG to oversee compliance with mitigation measures detailed in the Biological Opinion.

28. Provide a qualified wildlife biologist to monitor all activities that may result in incidental take of listed species or their habitat.

29. Conduct compliance inspections once per week and provide an annual compliance report to the Energy Commission, the USFWS Sacramento Field Office, and the CDFG Region 4 office.

30. Limit transmission line construction to daylight hours. For areas of high concentrations of nocturnal sensitive species (giant kangaroo rat, San Joaquin kit fox, Tipton kangaroo rat), work activities will be minimized during nighttime hours. Night lighting will be hooded.

31. Provide wildlife escape ramps for construction areas that contain steep-walled holes or trenches.

32. Fence open holes or trenches within 50-feet of giant kangaroo rat burrows. Fence will be hardware cloth or similar materials that are approved by USFWS and CDFG.

33. Inspect trenches each morning for entrapped animals prior to the beginning of construction. Construction will be allowed to begin only after trapped animals are able to escape voluntarily.

34. Inspect all construction pipes, culverts, or similar structures with a diameter of 4-inches or greater for kit foxes prior to pipe burial. Pipes to be left in trenches overnight will be capped.

35. Provide a post-construction compliance report, within 45 calendar days of completion of the project, to the USFWS, CDFG and the Energy Commission.

36. Complete, and institute, a habitat reclamation plan once temporarily disturbed habitat disturbance is completed. Annual inspections will occur for three years to check for compliance with the reclamation plan goals.

37. Make certain that all food-related trash will be disposed of in closed containers and removed at least once a week. Feeding of wildlife will be prohibited.

38. Prohibit firearms except for those carried by security personnel.

39. Prohibit pets from the project site.

40. Minimize the use of rodenticides and herbicides in the project area.

41. Report all inadvertent deaths of San Joaquin kit fox, San Joaquin antelope squirrel, giant kangaroo rat, or blunt-nosed leopard lizard to the appropriate La Paloma representative. Injured animals will be reported to CDFG, and follow instructions that are provided by CDFG.

42. Consult with USFWS, CDFG, and Energy Commission regarding appropriate protection measures for sensitive species following resolution of any emergency situation that takes place in sensitive habitat during clean-up activities; and

1. Acquire compensation lands to satisfy the requirements of state and federal endangered species acts, consistent with standard USFWS and CDFG compensation requirements for impacts to listed species habitats.

Verification: At least 60 days prior to start of any project related ground disturbance activities, the project owner shall provide the Energy Commission Compliance Project Manager (CPM) with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability within 15 days of receipt of the final plan. Implementation of the above measures will be included in the BRMIMP.

DESIGNATED BIOLOGIST

BIO-2 Construction site and/or ancillary facilities preparation (described as any ground disturbing activity other than allowed geotechnical work) shall not begin until an Energy Commission CPM approved Designated Biologist is available to be on site.

Protocol: The Designated Biologist must meet the following minimum qualifications:

43. a Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;

44. three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;

45. one year of field experience with biological resources found in or near the project area; and

46. an ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated sensitive areas until the CPM approves a new Designated Biologist and the new Designated Biologist is on site.

Verification: At least 90 days prior to the start of any ground disturbance activities, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement as specified in the condition must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

BIO-3 The CPM approved Designated Biologist shall perform the following during project construction and operation:

1. Advise the project owner's supervising construction or operations engineer on the implementation of the biological resource conditions of certification,

2. Supervise or conduct mitigation, monitoring and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species, and

3. Notify the project owner and the CPM of any non-compliance with any biological resources condition of certification.

Verification: During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

BIO-4 The project owner's supervising construction and operations engineer shall act on the advice of the Designated Biologist to ensure conformance with the biological resources conditions of certification.

Protocol: The project owner's supervising construction and operating engineer shall halt, if necessary, all construction activities in areas specifically identified by the Designated Biologist as sensitive to assure that potential significant biological resource impact are avoided.

The Designated Biologist shall:

4. Inform the project owner and the supervising construction and operating engineer when to resume construction, and

5. Advise the CPM if any corrective actions are needed or have been instituted.

Verification: Within two working days of a Designated Biologist notification of non-compliance with a Biological Resources condition or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-5 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities (including any access roads, storage areas, transmission lines, water and gas lines) during construction and operation, are informed about sensitive biological resources associated with the project.

Protocol: The Worker Environmental Awareness Program must:

1. be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;

2. discuss the locations and types of sensitive biological resources on the project site and adjacent areas;

3. present the reasons for protecting these resources;

4. present the meaning of various temporary and permanent habitat protection measures; and

5. identify whom to contact if there are further comments and questions about the material discussed in the program.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification: At least 60 days prior to the start of rough grading, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the Designated Biologist and the name and

qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six (6) months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six (6) months after their termination.

CALIFORNIA DEPARTMENT OF FISH & GAME INCIDENTAL TAKE PERMIT

BIO-6 Prior to start of any ground disturbance activities, the project owner shall acquire an Incidental Take Permit from the California Department of Fish and Game (CDFG) (per Section 2081(b) of the California Endangered Species Act) and implement the permit terms and conditions.

Verification: At least 60 days prior to the start of any project related ground disturbance activities the project owner shall submit to the CPM a copy of the final CDFG Incidental Take Permit. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan. (See also Condition of Certification **BIO-9**.)

U. S. FISH & WILDLIFE SERVICE SECTION 7 BIOLOGICAL OPINION

BIO-7 Prior to the start of any ground disturbance activities, the project owner shall provide final copies of the Biological Opinion per Section 7 of the federal endangered species act obtained from the U. S. Fish and Wildlife Service and incorporate the terms of the agreement into the Biological Resources Mitigation Implementation and Monitoring Plan. The project owner will implement the terms and conditions contained in the Biological Opinion (See also Condition of Certification **BIO-9**.)

Verification: At least 60 days prior to the start of any project related ground disturbance activities the project owner shall submit to the CPM a copy of the Biological Opinion. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan. (See also Condition of Certification **BIO-9**.)

CALIFORNIA DEPARTMENT OF FISH & GAME STREAMBED ALTERATION AGREEMENT

BIO-8 The project owner shall implement the provisions of the California Department of Fish and Game Streambed Alteration Agreement contained in Notification #4-176-98.

Protocol: California Department of Fish and Game Streambed Alteration Agreement provisions contained in Notification #4-176-98 will be included in the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) (See also Condition of Certification **BIO-9**.)

Provisions in the CDFG Streambed Alteration Agreement Notification #4-176-98 include:

1) Completion of all work in the streams when the work sites are dry;

2) Not removing or damaging woody perennial stream bank vegetation outside of the work area;

3) Not removing soil, vegetation, and vegetative debris from the streambed or stream banks;

4) Not exceeding the amount of fill placed within stream channels above that which naturally occurred in the stream channel prior to the start of work;

5) Not creating silty or turbid water when water returns to the stream, and not discharging silty water into the stream, nor creating turbid water within the stream;

6) Stabilizing slopes toward the stream to reduce erosion potential;

7) Locating equipment, material, fuel, lubricant and solvent staging and storage areas outside the stream, and using drip pans with motors, pumps, generators, compressors, and welders that are located within or adjacent to a stream;

8) Moving all vehicles away from the stream prior to refueling and lubricating;

9) Preventing any substance that could be hazardous to aquatic life from contaminating the soil and/or entering the waters of the area;

10) Cleaning up all spills immediately; and

11) Returning stream low flow channel, bed, or banks to as nearly as possible to their original configuration and width.

Verification: Streambed Alteration Agreement terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan. (See also Condition of Certification **BIO-9**)

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION & MONITORING PLAN

BIO-9 The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and shall implement the measures identified in the plan.

Protocol: The final BRMIMP shall identify:

1) All mitigation, monitoring and compliance conditions included in the Commission's Final Decision;

2) All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure;

3) All mitigation measures provided in the USFWS Biological Opinion and the CDFG Incidental Take Permit;

4) All provisions specified in the CDFG Streambed Alteration Agreement Notification #4-176-98;

5) All required mitigation measures for each sensitive biological resource;

6) Required habitat compensation, including provisions for acquisition, enhancement and management, for any temporary and permanent loss of sensitive biological resources;

7) A detailed description of measures that will be taken to avoid or mitigate temporary disturbances from construction activities;

8) All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;

9) Aerial photographs of all areas to be disturbed during project construction activities - one set prior to site disturbance and one set subsequent to completion of mitigation measures. Include planned timing of aerial photography and a description of why times were chosen;

10) Monitoring duration for each type of monitoring and a description of monitoring methodologies and frequency;

11) Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

12) All performance standards and remedial measures to be implemented if performance standards are not met;

13) A discussion of biological resource-related facility closure measures; and

14) A process for proposing plan modifications to the CPM and appropriate agencies for review and approval

Verification: At least 60 days prior to start of any project related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability within 15 days of receipt of the final plan. The project owner shall notify the CPM five working days before implementing any modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which mitigation and monitoring plan items are still outstanding.

HABITAT COMPENSATION

BIO-10 To compensate for temporary and permanent impacts to sensitive wildlife habitat, the project owner will purchase no less than 246.5-acres of suitable compensation habitat. Title for compensation habitat will be transferred to the Center for Natural Lands Management (CNLM) to be managed as part of the Lokern Preserve. The project owner will also provide a CNLM approved endowment, including land purchase administrative costs and habitat enhancement funds, to CNLM to ensure the perpetual management of the compensation habitat.

Verification: No later than 60 days prior to the start of any project related ground disturbance, the project owner must provide written verification to the CEC CPM that all compensation habitat purchases have been completed, and that title for all the parcels have been transferred to CNLM for management as part of the Lokern Preserve. At the same time, written verification must also be provided that shows that the associated endowment and any other required parcel transfer administrative funds have been deposited into an appropriate CNLM account for the perpetual maintenance of the Lokern Preserve parcels purchased by the project owner for this particular project. Also, a copy of the memorandum of understanding developed by the project owner and CNLM will be provided to the CEC CPM.

Within 90 days after completion of project construction the project owner shall provide the CPM aerial photographs taken after construction and an analysis of the amount of any additional habitat disturbance than that identified in this Energy Commission Final Staff Assessment. The CPM will notify the project owner of any additional funds required to compensate for any additional habitat disturbances at

the adjusted market value at the time of construction to acquire and manage habitat.

FACILITY CLOSURE

BIO-11 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the La Paloma BRMIMP. (See Condition of Certification **BIO-9**, above)

Protocol: The planned permanent or unexpected permanent closure plan will address the following biological resource-related mitigation measures:

1) Removal of transmission conductors when they are no longer used and useful;

2) Removal of all power plant site facilities; and

3) Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species.

Verification: At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

REFERENCES

California Department of Fish and Game. 1992. Bird Species of Special Concern. Unpublished document from the Wildlife Management Division, Nongame Bird and Mammal Section.

California Environmental Quality Act Guidelines. 1994. Governor's Office of Planning and Research. State of California.

California Native Plant Society. 1994. Inventory of Rare and Endangered Vascular Plants of California. Special Publication No. 1. 5th edition. 338 pp.

LPGP (La Paloma Generating Project). 1998a. Application for Certification, La Paloma Generating Project (98-AFC-2). Submitted to the California Energy Commission, August 12.

LPGP (La Paloma Generating Project). 1998a. Application for Certification, Addendum II, La Paloma Generating Project (98-AFC-2). Supplemental material to Applicant's AFC - Biological Assessment. Submitted to the California Energy Commission, October 27.

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LPGP (La Paloma Generating Project). 1998. Application for Certification, addendum IX, La Paloma Generating Project (98-AFC-2). A supplement that 1) presents a route deviation of the proposed transmission line to go around a California Department of Fish and Game ecological reserve; and 2) revises stack ammonia emissions. Submitted to the California Energy Commission, March 16, 1999.

LPGP (La Paloma Generating Project). 1998a. Application for Certification, addendum X, La Paloma Generating Project (98-AFC-2). A supplement that presents the biological resource survey of transmission line reroute to avoid the Lokern Ecological Reserve. Submitted to the California Energy Commission, March 17, 1999.

LPGP (La Paloma Generating Project). 1999 BRMIMP. Biological Resources Mitigation Implementation and Monitoring Plan. Submitted to the California Energy Commission, January 22, 1999.

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U. S. Fish and Wildlife Service. 1998. Recovery plan for upland species of the San Joaquin Valley, California. Region 1, Portland, OR. 319 pp.

SOIL AND WATER RESOURCES

Testimony of Joseph O'Hagan

INTRODUCTION

This testimony analyzes the water and soil resource aspects of the La Paloma Generating Project (LPGP), specifically focusing on the potential for the project to induce erosion and sedimentation, adversely affect surface and groundwater supplies, degrade surface and groundwater quality and increase the potential for flooding. This testimony also addresses the project's ability to comply with all applicable federal, state and local laws, ordinances, regulations and standards, identifies mitigation measures and recommends conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

CLEAN WATER ACT

The Clean Water Act (33 USC § 1257 et seq.) requires states to set standards to protect water quality. Point source discharges to surface water are regulated by this act through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. Stormwater discharges during construction and operation of a facility and incidental non-stormwater discharges associated with pipeline construction also fall under this act, and are addressed through a general NPDES permit. In California, requirements of the Clean Water Act regarding regulation of point source discharges and stormwater discharges are delegated to and administered by the nine Regional Water Quality Control Boards (RWQCB). Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. Site specific or general (nationwide) permits for such discharges are issued by the Army Corp of Engineers (ACOE) and are certified by the RWQCBs.

SAFE DRINKING WATER ACT

The Safe Drinking Water Act (42 USC § 300 et seq.) is designed to protect the quality of drinking water in the United States. Part C specifically mandates the regulation of underground injection of fluids through wells. Section 1421 of the Act requires the United States Environmental Protection Agency (EPA) to propose and promulgate regulations specifying minimum requirements for state programs to prevent underground injection that endangers drinking water sources. In California, the EPA permits all Class I wells. Class I wells are those facilities used to inject hazardous or non-hazardous wastewater below a Underground Source of Drinking Water. An Underground Source of Drinking Water are those aquifers with water having a total dissolved solids concentrations less than 10,000 mg/l.

STATE

PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The criteria for the project area are contained in the Central Valley Region Water Quality Control Plan (Basin Plan 1994). The Porter-Cologne Water Quality Control Act also requires the SWRCB and the nine RWQCBs to ensure the protection of water quality through the regulation of waste discharges to land. Such discharges are regulated under Title 23, California Code of Regulations, Chapter 15, Division 3. These regulations require that the RWQCB issue a Waste Discharge Requirement which specifies conditions regarding the construction, operation, monitoring and closure of the waste disposal site, including injection wells for waste disposal. In this case, the EPA will be permitting an injection well and a Waste Discharge Requirement is not required (Waas 1999).

Section 13552.6 of the Water Code specifically identifies that the use of potable domestic water for cooling towers, if suitable recycled water is available, is an unreasonable use of water. The availability of recycled water is based upon a number of criteria, which must be taken into account by the SWRCB. These criteria are that: the quality and quantity of the reclaimed water are suitable for the use; the cost is reasonable; the use is not detrimental to public health; the use will not impact downstream users or biological resources; and the use will not degrade water quality.

Section 13552.8 of the Water Code states that any public agency may require the use of recycled water in cooling towers if certain criteria are met. These criteria include that recycled water is available and meets the requirements set forth in section 13550; the use does not adversely affect any existing water right; and if there is public exposure to cooling tower mist using recycled water, appropriate mitigation or control is necessary.

STATE WATER RESOURCES CONTROL BOARD POLICY 75-58

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the State Board which addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on June 19, 1976 by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy requires that power plant cooling water should, in order of priority come from wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland waste waters of

low total dissolved solids, and other inland waters. This policy goes on to address cooling water discharge prohibitions.

401 WATER QUALITY CERTIFICATION

Section 401 of the Clean Water Act provides for state certification that federal permits allowing discharge of dredged or fill material into waters of the United States will not violate federal and state water quality standards. For the LPGP, a number of the proposed linear facilities cross ephemeral drainages which are considered waters of the United States. The Central Valley RWQCB will issue the 401 certification for this project.

LOCAL

Kern County Code of Building Regulations, Chapter 17.28 sets forth grading requirements.

ENVIRONMENTAL SETTING

SITE DESCRIPTION

The proposed project is located on the edge of the southern San Joaquin Valley in western Kern County. The 23-acre power plant site and adjacent 23-acre laydown area are located approximately 1.9 miles east of the town of McKittrick. Associated linear facilities include a 14.2-mile transmission line, a 8.0-mile makeup water pipeline, a 1.5 mile potable water pipeline and a 370-foot natural gas line. In addition, La Paloma has identified a number of alternative routes for these facilities. The proposed routes for these facilities are shown in Project Description Figure 1.

The proposed power plant site is located on the western edge of the McKittrick Valley on alluvial fan deposits derived from the highly dissected Temblor Range. McKittrick Valley is bounded on the west by the Temblor Range and on the east by the Elk Hills, which separates the valley from the main portion of the San Joaquin Valley. Site elevation ranges from 956 feet to 997 feet. Areas of stained soil are present on-site, as expected in the vicinity of active oil production facilities (LPGP 1998b). The site gently slopes from the southwest to the northeast. Soils present at the power plant and laydown areas are classified as Kimberlina Sandy Loam. No perennial water bodies are found within the site vicinity. Several small, ephemeral drainages cross the proposed power plant and construction lay down sites. The watersheds of these drainages are in the foothills of the Temblor Range. One drainage crosses the power plant site while another dissipates within the site boundary. A third crosses the construction laydown area (LPGP 1998a, Figure 5.5-1). The latter two drainages carry occasional storm flows into a wash that drains McKittick Valley before flowing on through the Elk Hills.

Borings drilled for the preliminary subsurface investigation of the site indicate that the groundwater table occurs at least 65 feet below the ground surface. There are no water-producing domestic or irrigation wells located in the vicinity of the plant

site. There are, however, four oil wells on-site, three of which have been abandoned (Department of Oil and Gas 1998; LPGP 1998b; Chillson 1999). The remaining well may have been improperly closed (Department of Oil and Gas 1998).

Little information on groundwater in the project vicinity is available. Information from the McKittrick Waste Treatment Site (Geomatrix 1998), approximately one mile west of the community of McKittick, indicates that groundwater is of poor quality. Shallow groundwater, encountered approximately 17 to 40 feet below the ground surface, has tds levels ranging from approximately 3,000 mg/l to over 27,000 mg/l. Groundwater encountered below these depths are of better quality, ranging from approximately 2,800 mg/l to 4,600 mg/l.

The routes of the associated linear facilities cross dissected uplands consisting of foothills, alluvial fans and valley fill (LPGP 1998a). Soils found in these areas generally have a sandy loam surface texture and have moderate to high water erosion hazard ratings. The last four miles of the transmission line crosses basin deposits characteristic of the San Joaquin lowlands. Soils found on gentler slopes range in surface texture from sandy loams to clay loams and have a moderate water erosion hazard rating. The transmission line crosses the West Side Canal and the California Aqueduct. The makeup water pipeline will originate at a turnout at the aqueduct.

WEST KERN WATER DISTRICT

The proposed LPGP is within the boundary of the West Kern Water District (WKWD). This water district covers approximately 250 square miles of western Kern County and serves a population of approximately 25,000 people, residing in the Cities of Taft and Maricopa, as well as a number of unincorporated communities (WKWD 1997). The district also has approximately 400 connections for industrial users. The district obtains its water supply from local groundwater and the State Water Project (SWP). WKWD, in conjunction with the Buena Vista Water Storage District (BVWSD) uses State Water Project water for its groundwater banking and recharge program. From 1986 to 1996, WKWD (1997) on average received 19,587 acre feet of SWP water. As shown in SOIL & WATER RESOURCES Table 1, the district has banked over 200,000 acre feet of water. In addition, other water may be available by agreement with water agencies and other entities throughout Kern County. In water year 1995-1996, total water district water demand was 13,239 acre feet of water. Between 1986 and 1996, the average demand has been 13,041 acre feet of water.

WKWD is entitled to 25,000 acre feet of SWP water per year through a contract with the Kern County Water Agency. An additional 10,000 acre-feet of State Water Project water, known as interruptible water, is also available to the district during wet years (WKWD 1997).

WKWD obtained and maintains its banked groundwater through an in-lieu groundwater banking and pumping program with the BVWSD. BVWSD obtains its

water supply from groundwater, the Kern River and the State Water Project both as a contracting entity and through the banking agreement with WKWD. As part of the agreement with WKWD, BVWSD delivers WKWD's State Water Project water from the California Aqueduct to its landowners instead of pumping local groundwater (WKWD 1997). WKWD then can pump or bank a volume of groundwater equivalent to the amount of State Water Project water supplied to BVWSD.

The availability of State Water Project supplies is variable and subject to cutbacks during drought years. The district attempts each year to obtain the maximum amount of State Water Project water available and is usually able to bank all of its State Water Project water through the banking agreement with BVWSD. SOIL & WATER RESOURCES Table 1 shows the amount of State Water Project water received, water acquired from other sources, water demand and water banked for water years 1990 through 1996. As of June 1998, WKWD has banked approximately 216,000 acre feet of groundwater. Since 1990, WDWD has banked on average over 12,000 acre feet per year through its agreement with BVWSD. Because of water treatment requirements, groundwater is provided for all domestic uses.

SOIL & WATER RESOURCES Table 1
West Kern Water District Water Supply

Water Year	SWP Entitlement	SWP Interruptible	Tehachapi-Cummings	Water Purchased	Water Sold	Water Banked
1990-1991	24,348	0	5,477	29,825	10,948	155,488
1991-1992	10,464	32	1,792	12,289	14,755	155,408
1992-1993	9,496	0	5,310	14,806	12,335	160,137
1993-1994	19,523	5,387	2,325	27,235	12,317	174,484
1994-1995	19,838	5,465	5,050	30,353	11,334	194,956
1995-1996	25,000	0	0	25,000	13,239	216,503
Total	108,705	10,884	19,945	139,508	74,928	-
Average	18,118	1,814	3,326	23,251	12,488	13,165

Source: WKWD 1997

The District's well field is located approximately 15 miles northeast of Taft in the Tupman area (WKWD 1997). Total peak production capacity of the six active wells is 99 acre-feet per day, but maximum daily usage averages approximately 41.5 acre-feet per day (WKWD 1997). The district has another agreement with the BVWSD to pump 3,000 acre-feet of groundwater per year. This water cannot be banked and therefore the district uses this water first (WKWD 1997). The district must recharge the basin for the amounts pumped in excess of 3,000-acre feet. Average basin recharge between 1979 and 1996 has been 11,250 acre-feet (WKWD 1997). Because of water treatment requirements, groundwater is provided for all domestic uses.

State Water Project water quality is variable, depending on fresh water inflows into the delta. Annual and seasonal variation for some constituents can be high. For example, during high runoff years, the concentration of salts, such as chloride, sulfate and sodium, are significantly lower than concentrations during low runoff years (Department of Water Resources [DWR] 1997). Furthermore, concentration

of some constituents may increase farther south on the aqueduct due to non-project put-ins. During 1994 and 1995, total dissolved solid (TDS) concentrations varied from less than 100 mg/l at the delta to over 500 mg/l at Castaic Lake (DWR 1997).

ENVIRONMENTAL IMPACTS

PROJECT SPECIFIC IMPACTS

EROSION AND SEDIMENTATION

Accelerated wind and water induced erosion may result from earth moving activities associated with construction of the proposed project. Removal of the vegetative cover and alteration of the soil structure leaves soil particles vulnerable to detachment and removal by wind or water. Typical of an arid environment such as the western San Joaquin Valley, rainfall may be intense, which greatly enhances the potential for water erosion. Grading activities may redirect runoff into areas more vulnerable to erosion. Areas where linear facilities cross drainages are also vulnerable to erosion.

As discussed above, the sensitivity of the soils that will be affected by the proposed project to water and wind erosion varies from low to high. The water erosion hazard for all soils affected by the project is medium to high, while the wind erosion hazard for all soils affected is low. Once the protective cover of vegetation is removed and the structure of the surface soil has been altered, however, all of these soils are highly vulnerable to erosion. The **Biological Resources** section provides a table showing estimated temporary and permanent disturbance resulting from construction and operation of the project.

The existing topography at the power plant site will be cut and filled to an elevation of about 982 feet above sea level (ASL). Approximately 55,000 cubic yards of cut and 60,000 cubic yards of fill will be required to achieve the finished graded. An estimated 7,000 cubic yards of borrow material will need to be obtained in order to build the site up to 982 feet ASL (LPGP 1998a). Excavation activities at the power plant site will require the storage of material suitable for backfill and the removal of unsuitable material from the site and disposal at an appropriate landfill. Some vegetation removal and earth moving activities are anticipated at the 23-acre laydown area. Disturbance associated with construction of the water and gas pipelines and the transmission line will mainly be limited to within the 60-foot right-of-way. For the transmission line, disturbance outside the right-of-way will include access roads and pull and tension sites. For the water supply pipeline disturbances outside the right-of-way will include a one-acre construction staging area.

A new 700,000-gallon reservoir tank and a free standing communication tower will be added along the makeup water supply pipeline which will control pump operations at the aqueduct pump station. The welded steel storage reservoir will be approximately 74 feet in diameter and 24 feet high installed on a concrete ring foundation. Approximately one-half acre of land will be disturbed during construction of the storage reservoir. An average excavation depth of nine feet will

result in approximately 5,000 cubic yards of material being excavated and removed from the reservoir site. This material may be utilized at the aqueduct pump station site or at the plant site. No natural drainages will be disturbed and on-site stormwater runoff will be directed toward natural drainage channels.

The proposed turnout on the California Aqueduct and pump station will be totally contained within the existing flood protection area with no relocation of the existing levee as identified originally in the Application for Certification (AFC). This will require the importation and compaction of approximately 5,000 cubic yards of material to raise the pump station area to the same grade as the aqueduct road and Highway 58. (LPGP 1998a, Addendum V).

Excavation through the flood protection levee will be required for construction of the 24-inch water supply pipeline. Installation of the pipeline will require trench excavation approximately 12 feet deep and will occur at the lowest grade of the levee. The levee will be restored by recompaction to existing grades after pipeline installation (LPGP 1998a, Addendum V).

Impacts from the water supply line will be limited to land disturbance during construction. This includes approximately 11 acres, based upon a 60-foot width over a distance of approximately 8,000 feet. Construction will occur adjacent to Reserve Road between the proposed plant site and the tie-in point in McKittrick.

Construction of the transmission line is anticipated to impact approximately 38 acres for Route 1 (LPGP 1998a). Route 1B, an alternative to Route 1, would add approximately 4.6 acres of disturbance during construction (LPGP 1998a, Addendum IX, page 2-3). The construction of the natural gas supply line for Route 5 will be occur primarily within existing road rights of way and would not cross any surface drainages. The impacts from the raw water supply line will be limited to approximately 60 acres for Route 2.

During project operation, wind and water action can continue to erode unprotected surfaces. An increase in the amount of impervious surfaces can increase runoff, leading to the erosion of unprotected surfaces. La Paloma has provided a draft Erosion Control and Stormwater Management Plan that identifies potential temporary and permanent erosion and stormwater runoff control measures (LPGP1998a, Data Response 20). This plan is discussed further below.

The Kern County Environmental Health Department is the Certified Unified Program Agency for the project area. Department staff (Brownfield 1999) indicate that the small amount of petroleum contaminated soil is not considered a hazard and that such material was regularly used as asphalt for roads.

The two proposed LPGP water pipelines cross approximately 15 ephemeral streams which are considered, under the Clean Water Act, waters of the United States (Army Corp of Engineers 1998). Construction of the water pipelines will conducted under Nationwide Permit No.12 which has already been issued for the project. This nationwide permit addresses all discharges into waters of the U.S. of fill or dredged material associated with excavation, backfill or bedding activities for

utility lines, as long as there is no change in preconstruction contours and less than three acres are disturbed (ACOE 1997). The Central Valley RWQCB is conducting the 401 water quality certification for these activities. The Regional Board staff has reviewed the request and found, based upon the information provided, that there is not likely to be a significant threat to water quality (Waas1999). The Regional Board, however, cannot act on the certification until a California Environmental Quality Act equivalent report is prepared.

WATER SUPPLY

The proposed LPGP water demand is approximately 5,308 gallons per minute (gpm) for average conditions and 7,360 gpm for maximum conditions. Assuming average operating conditions over the course of a year, La Paloma estimates that the project, assuming a 93 percent capacity factor, will require 5,530 acre-feet of water (LPGP, 1998a). Assuming maximum operating conditions over the course of a year, La Paloma estimates that the project, assuming a 100 percent capacity factor, will require approximately 6,000 acre-feet. The project, over the course of a year, will operate in both average and maximum modes, therefore, actual annual water demand is probably somewhere between these two numbers. The majority of this water, approximately 93 percent under average operating conditions, is used for cooling tower makeup.

The source of the makeup water for the LPGP's cooling towers, service water and cycle makeup treatment system is State Water Project water from a new turn-out in the California Aqueduct. No backup water supply has been identified by La Paloma for this demand (LPGP 1998a, data response 21).

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In addition, WKWD will provide potable water to the La Paloma through an interconnection with the district's existing distribution system in McKittrick. Project demand for potable water is approximately 3 gpm or 3.4 acre-feet per year.

It is proposed that State Water Project water be provided to the LPGP by the WKWD from their existing 25,000 acre foot Kern County Water Agency member unit entitlement to this water (LPGP 1998a, Appendix N). Between 1986 and 1996, WKWD received on average 19,587 acre feet of State Water Project water, which the district delivered to BVWSD for groundwater banking. Since 1990 water demand for the district has averaged approximately 13,200 acre feet of water per year (WKWD 1997). Water demand for the district in water year 1995-96 was 13,239 acre-feet (WKWD 1997). Providing water to the project will represent an increase of approximately 45 percent in the district's water demand.

Service of the proposed project does not represent a new water right or a new diversion of State Water Project water. As noted above, WKWD historically has diverted as much State Water Project water as possible, most of which has been banked through the exchange program with BVWSD (LPGP 1998a, Appendix N; WKWD 1997). In addition, provision of water to the project does not represent a change in place of use.

Demand for WKWD has generally declined over the last 25 years. Peak water demand within the district during this time period occurred in 1983-84 when 17,403-acre-feet of water were sold (WKWD 1997). The district anticipates that there will be minimal additional demand in the future for district water from the oil producers within the district boundary and that population growth will continue to be low (WDWK 1997).

During drought periods when SWP water available to the district is insufficient to meet the proposed project's demand, WKWD intends to take banked groundwater and place this water back into the aqueduct. Currently, WKWD has 216,000-acre feet of water banked (LPGP 1998a, Appendix N). WKWD has placed groundwater into the aqueduct before. Currently, WKWD and KCWD are negotiating with DWR regarding an agreement to continue allowing the district the ability to place groundwater into the aqueduct (Patrick 1998; Pearson 1999). There is no available pipeline that would allow WKWD to provide groundwater directly to the project. BVWSD has notified Energy Commission staff that the district feels that it, under contractual agreement with WKWD, is entitled to the SWP water being provided the proposed project. BVWSD indicates, however, that they are not opposed to the project and are confidant that an agreement can be reached regarding this issue (Milobar 1998; 1999).

Comments from WKWD (Saperstein 1999) and BVWSD (Milobar 1999a,b) indicate that it is possible to supply groundwater to the LPGP via the California Aqueduct. As noted above, groundwater from WKWD's wells can be placed into the aqueduct in the vicinity of Tupman to make up any shortfall in the district's entitlement through the Kern County Water District due to diversions by the proposed project. To the best of staff's knowledge, the applicant has not proposed this option nor has staff conducted an evaluation of this option.

Certainly, between the district's entitlement to State Water Project water, banked groundwater, and the ability to buy interruptible water and water from other sources, supplying water to LPGP will not adversely effect the district's ability to supply its existing customers nor curtail the district's ability to meet future demand. This, however, does not take into account the concerns expressed by BVWsD.

To provide State Water Project water to the proposed project a new turnout in the California Aqueduct will be required.

WATER QUALITY

Incorrect disposal of wastewater or inadvertent chemical spills can degrade soil, surface water and groundwater. La Paloma (LPGP 1998a) plans to dispose of liquid waste through the use of three injection wells located on the power plant and laydown areas (Kennedy-Jenks 1998). One of these wells would be used for backup. Liquid waste to be disposed of through injection consists of cooling tower blowdown and effluent from the oil-water separator. Effluent from the oil-water separator consists of stormwater runoff and other water collected from portions of the project where oil and grease may be present. La Paloma (LPGP 1998a)

estimated wastewater flows to the injection wells are shown in SOIL & WATER RESOURCES Table 2.

Table 3.4-4 of the AFC shows the anticipated characteristics of the two wastewater streams. The characteristics of the cooling tower blowdown are based upon the source water characteristics shown in Table 3.4-2 and 10 cycles of concentration through the cooling cycle.

SOIL & WATER RESOURCES Table 2
Estimated Wastewater Volumes

Waste Stream	Daily Average	Daily Maximum
Cooling Tower Blowdown	501,000 gpd	698,000 gpd
Oil-Water Separator	43,000 gpd	43,000 gpd
Total to Injection Well	544,000 gpd	732,000 gpd

Source: LPGP 1999a

La Paloma submitted an application for an underground injection well permit with the United States Environmental Protection Agency (EPA) on February 16, 1999 (Kennedy/Jenks 1999). The federal permit is expect late Summer or early Fall.

The injection zone for the three wells would be in the Tulare Formation, a non-marine formation of Plio-Pleistocene age with an estimated thickness of 850 feet. Injection within this formation would be below the Corcoran Clay (E-Clay), a discontinuous confining layer about 25 feet thick that is within the Tulare Formation (Kennedy/Jenks 1998; 1999). The confining layer was further characterized by Kennedy/Jenks (1999) as consisting of a low permeability shale-like layer on unspeicfied thickness. Total dissolved solids (TDS) levels within the Tulare Formation range from 2,000 mg/l to 21,000 mg/l. The groundwater in the Tulare Formation is reported to have very little recharge from the surface and groundwater flows natural from the southwest to northeast.

Concerns about injection well disposal mainly focus on the potential for degradation of groundwater, especially potential sources of drinking water. The feasibility of using injection wells relates to the potential for well clogging, blow outs from excess pressure and chemical reactions between fluids in the receiving formation and the wastewater. Kennedy/Jenks (1998; 1999) did not identify any water supply wells within a one mile radius of the site.

In August of 1998, as part of a pilot study a well (La Paloma No. 1) was drilled to a depth of 1,600 feet below ground surface (bgs). This well was drilled under a permit from the California Division of Oil and Gas. The well was cased from 0 to 1010 with a perforated interval from 325 to 1,010 feet bgs (Kennedy/Jenks 1998). The depth of the injection zone will be from 350 feet to 1000 feet bgs.

The analytical results for samples collected at 790 and 1,002 feet bgs for TDS were 7,000 and 9000 mg/l respectively (Kennedy-Jenkins 1998). In comparison, the wastewater proposed for disposal by injection will have an approximate TDS content of 3,100 mg/l (Kennedy/Jenks 1998). The potential exists, however, that

these TDS samples were contaminated by drilling mud. Additional sampling will be conducted.

The initial injection testing performed immediately after drilling La Paloma No. 1 resulted in minimal injection rates, due to insufficient removal of the drilling mud cake. A pump rig was moved to the site last fall to swab the well. Staff is currently awaiting the results of these most recent injectivity tests, but La Paloma (Chillson 1998) indicates that the results are quite good. Additional injection tests will be performed after development of the well is completed (Kennedy/Jenks, pg. 15).

The injected groundwater is expected to result in an increase in the groundwater levels underlying the project but because the regional groundwater flow is minimal, the injected fluid is expected to move away from the wellbore radially. The major assumptions used to calculate the volumetric and pressure build-up method of indicating the zone of endangering influence are the porosity of the formation and the storage coefficient. The average rate of movement, including dispersion, away from the injection wellfield, was estimated (Kennedy/Jenks 1998) to be:

1 year	336 ft/year
5 years	140 ft/year
10 years	97 ft/year
15 years	78 ft/year
20 years	67 ft/year

In general, EPA permits for Class I wells include conditions addressing: well construction; injection intervals; monitoring of wastewater to be injected; testing well integrity; pressure and wastewater limitations; demonstrating that injectate is confined to the proposed zone; and monitoring of flows, pressure and wastewater.

CUMULATIVE IMPACTS

Temporary and permanent disturbance associated with construction of the proposed project will cause accelerated wind and water induced erosion. La Paloma's proposed mitigation measures should ensure that the proposed project will not contribute to cumulative erosion and sedimentation impacts. The makeup (raw) water supply for the proposed project, State Water Project water, represents a re-direction of water historically diverted by the WKWD. Two other proposed power plant projects, the Elk Hills Power Project and the Sunrise Cogeneration and Power Project have proposed using water from the WKWD. The Elk Hills Power Project (99-AFC-1) proposes to use at base load approximately 3,000-acre feet of water per year. This water would entirely be groundwater from the district. The Sunrise Cogneration and Power Project (98-AFC-4) proposes to use approximately 64.5 acre feet of water per year from the district. Other water demand from this project will be met by using produced water from the oil field. Although these two projects, in conjunction with the LPGP, represent a significant increase in water demand for the WKWD, it is clear the district has sufficient supplies to meet these demands.

FACILITY CLOSURE

A planned, unexpected temporary or permanent closure of the proposed LPGP should not be a significant concern if the injection wells and site drainage and erosion are properly dealt with for any potential closure. The California Division of Oil and Gas, and the EPA have requirements for the closure of injection wells. The EPA will require financial assurance to address well closure for the project. Unexpected permanent closure may raise pose the potential for drainage and erosion problems due to a lack of maintenance of the facilities. Staff will require La Paloma address this concern in their closure plan.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Staff's evaluation of the proposed LPGP concludes that the proposed project will comply with all applicable laws, ordinances and standards with the following exceptions.

SWRCB POLICY 75-58

This policy states that the source of power plant cooling water should come from the following sources in order of priority:

1. Wastewater being discharged to the ocean;
2. Ocean water;
3. Brackish water from natural sources or irrigation return flow;
4. Inland wastewaters of low total dissolved solids; and
5. Other inland waters.

Clearly, the first two sources listed are not reasonable options for the proposed project. Nor does irrigation return flows represent a reliable or sufficient water source. Wastewater treatment effluent is also not available. Produced water, however, which is a brackish, natural water pumped up with oil is a potential water source that could be used for project cooling. The quality of this water varies greatly.

The groundwater data already provided by Chevron that was collected from wells located in T29S R22E Section 35 and T30S R22E Section 15 indicate a variation in the quality of water obtained from the various wells sampled.

Well Field	T30S R22E Section 15	T29S R22E Section 35
Ave [TDS] (mg/L)	4473	3757
Std Deviation (mg/L)	1687	279

(Source: Klinchuch, 1999)

Insufficient produced water is available from the oil field where the project is located. The applicant did approach Chevron, the nearest oilfield operator with significant amounts of produced water to the project site, about securing produced water for the project. At that time, Chevron indicated that produced water would not be available for the project (Sirgo 1999). Since that time Chevron's plans have changed and produced water may be available for the project. Staff has requested information from Chevron on this potential source. Chevron has scheduled a meeting with the applicant regarding project use of this water source and will respond to staff's questions following this meeting.

The policy goes on to state that, where the SWRCB has jurisdiction, use of fresh inland waters for power plant cooling will be approved only when it is demonstrated that the use of other water sources or other methods of cooling are environmentally undesirable or economically unsound. Use of produced water from Chevron will include some additional treatment costs for the LPGP, as well as those costs associated with constructing and operating a pipeline of unknown length. This may be economical only if it negates the need for construction of the aqueduct turnout and the associated pipeline.

This policy, however, only addresses the use of fresh inland waters for power plant cooling. Produced water can be used for the steam cycle, but that does raise water treatment costs even more. The use of produced water, with the exception of the need for a new pipeline, should not raise additional environmental issues, with the exception of PM10 emissions from the cooling tower. Certainly, the use of injection wells for wastewater disposal is still feasible if produced water is used.

The SWRCB policy also calls for water availability studies for projects to be constructed in the Central Valley to consider potential impacts on Delta outflow and water quality objectives. Since La Paloma is proposing to use SWP water that has historically been diverted by WKWD, the proposed use should have no effect on Delta outflows or water quality objectives.

DRY AND WET/DRY COOLING

SWRCB Policy 75-58 also states that "…studies associated with power plants should include an analysis of the cost and water use associated with the use of alternative cooling facilities employing dry, or wet/dry modes of operation."

Cooling towers reject heat from a power plant's steam rankine cycle to condense the steam exiting the steam turbine and to maintain the lowest possible condenser vacuum. The heat rejection mechanism in wet cooling towers is primarily the evaporation of water to the atmosphere. Dry cooling towers transfer heat convectively through heat exchangers, while wet/dry hybrid cooling towers use combinations of the two mechanisms to reject heat to the atmosphere.

Cooling towers use forced or induced draft to move ambient air through the tower. The ambient air temperature, humidity, velocity, and mass flow rate affect the heat transfer rate and, ultimately, the efficiency of the cooling tower. The cooling tower

heat rejection efficiency and pump and fan loading affect the overall power plant thermal efficiency and output.

The fundamental differences between wet, wet/dry hybrid, and dry cooling towers are initial capital costs and heat rejection effectiveness. Dry cooling towers are two to three times more expensive than a wet system. Hybrid systems fall in the range between the two, depending ratio of "wet to dry" cooling in the hybrid design. In general, the cost differences are due to the dry condenser, or heat exchanger, and taller and larger structures for dry and hybrid cooling systems.

Despite the significant cost differences, dry and hybrid cooling systems are occasionally employed because they use less water and reduce the occurrence of visible plumes compared to wet systems. For the Sutter Power Project (97-AFC-2), a combined cycle project, the switch from conventional wet cooling towers to dry cooling represented a 95 percent reduction in project water demand. For wet/dry hybrid systems, the reduction in water use is depended on the percentage of dry versus wet.

Dry and hybrid cooling systems are, however, less efficient in rejecting heat, and generally have higher parasitic (fan) electrical loads and can create a higher pressure (temperature) in the steam turbine condenser. Both of these factors decrease the thermal efficiency and power output of the project.

The effects are not as significant on a combined cycle project as compared to a steam-cycle only project, in that the cooling system only affects the steam side of the combined cycle project and not the performance of the gas turbine. The effect would be greater at higher ambient temperatures because the relationship is non-linear. Additional fuel can be burned to overcome some or all of the loss of output, but the fuel will be an additional operating cost and will produce additional air pollutant emissions. Other characteristics include, for example, higher noise impacts for dry or hybrid cooling systems relative to a wet system due to larger fans to move more ambient air through the tower.

A comparison of dry, hybrid, and wet cooling towers ultimately depends on the specific needs of the proposed application. Dry and hybrid cooling systems provide benefits in the areas of water use and plume visibility, but with some performance degradation and additional costs. Additionally, dry and hybrid cooling can be noisier, use additional fuel, or be a more visually obtrusive structure.

Staff intends to provide its evaluation on project compliance with SWRCB Policy 75-58 in a supplemental filing prior to the evidentiary hearing.

EPA is anticipating an Underground Injection Control Permit will be issued this summer or fall. In addition, the RWQCB has indicated that the 401 Water Quality Certification cannot be issued until California Environmental Quality Act (CEQA) documentation has been certified (Waas 1998).

EROSION AND SEDIMENTATION

La Paloma (1998a, Data Response 20) has provided a draft Erosion Control and Stormwater Management Plan that identifies temporary and permanent erosion and stormwater control measures. Furthermore, the intent of this plan, when finalized, is to serve as the stormwater pollution prevention plan as required under the General Construction and Industrial Activity Stormwater Permits issued by the State Water Resources Control Board.

The draft plan identified a number of potential best management practices for the construction and operation phases of the project.

BEST MANAGEMENT PRACTICES THAT REDUCE EROSION AND SEDIMENT-LADEN STORMWATER RUNOFF

- Cover disturbed soils with mulch; this may be used in combination with temporary or permanent seeding strategies;
- Direct runoff away from disturbed areas by means of temporary drainage ways;
- Stabilize plant site roadways with compaction or gravel;
- Utilize soil stabilizers (most commonly water) on disturbed areas as appropriate and as required in Air Quality conditions;
- Utilize straw bale barriers to intercept sediment-laden runoff from small areas of disturbed soil;
- Create straw check dams to reduce erosion of existing drainage channels and to promote sedimentation behind the dam;
- Place Silt fencing to promote sedimentation behind silt fence; and
- Create stormwater retention basins to retain runoff and allow excessive sediment to settle out.
- Inspect temporary erosion control devices during construction in accordance with the Final Plan schedule;
- Insure replacement of damaged or missing structures;
- Notify project construction crew when to implement adequate precautions in anticipation of poor weather conditions;
- Dictate appropriate wetness when watering a road for dust suppression;
- Develop remedial erosion controls for problem areas, if any; and
- Complying with applicable codes.
- Protect stockpiled soil a water-resistant tarp, protect stockpiles from runoff with hay bales or silt fencing, or surpress dust with watered;
- Install temporary slope breakers (water bars or berms) at the portion of the pipeline that crosses grades steep enough to require such measures to divert water off the construction right-of-way and reduce velocities;
- Slope breakers will be installed at a spacing recommended by the Bureau of Land Management or Natural Resources Conservation Service; and
- Slope breakers may be constructed from soil, silt fences, or stalked hay or straw bales.

- Straw bale barriers and/or check dams will be inspected and replaced or repaired as needed. Accumulated sediment will be removed when it reaches a depth of 6 inches;
- Sandbags placed along the toes of slopes and at linear facility structures will be inspected. Sediment will be removed after each significant storm event and deposited in a stable area not subject to erosion;
- If sediment accumulates over 1 foot behind the (sandbag) barrier, the contractor will remove or regrade the sediment;
- Mulched areas will be examined for damage or deterioration and reapplied as necessary;
- Protected storage areas for stockpiled soils or other materials will be inspected. Tarps or other coverings will be replaced and secured;
- Depending on the season, slope breakers will be inspected in areas of active equipment or within 24 hours of each 0.5 inch of rainfall; and
- Slope breakers will be maintained until revegetation measures are successful or the area is stabilized.

BEST MANAGEMENT PRACTICES TO PREVENT STORMWATER CONTAMINATION

- Provide secondary containment for hazardous material delivery and storage areas to prevent spills or leakage of fluid materials from contaminating soil or soaking into the ground;
- Covered dumpsters and waste containers; and
- Designate storage areas for construction wastes.
- Provide for proper storage of hazardous materials, paints, and related products;
- Train employees on the proper use of materials such as fuel, oil, asphalt and concrete compounds, acids, glues, solvents, etc.;
- Implement a spill prevention and control plan;
- Timely remove construction wastes;
- Store all liquid wastes in covered containers; and
- Use portable toilet facilities managed by licensed contractor.

SPILL PREVENTION

Spill containment measures will be provided for chemical storage tanks and chemical additive/lube oil skid areas. The containment structure for the aqueous ammonia storage tank will be sized for 125 percent of the tank capacity. All other chemical storage tanks will be provided with a containment structure with a volume equal to at least 110 percent of the tank capacity. In addition, all outdoor containment structures will have a volume equal to at least the capacity of the tank plus the volume of rainfall from a 50-year, 24-hour storm. Concrete curbs will be provided for chemical additive/lube oil skid areas. Where required for protection of the containment structure, appropriate surface coatings will be provided.

SITE DRAINAGE

The site drainage system will be designed to comply with all applicable federal, state, and local regulations. Onsite drainage will be accomplished by gravity flow, whenever possible. The surface drainage system will consist of mild slopes and open channels. The ground floor elevation of buildings and structures will be

maintained at a minimum of 6 inches above the finished grade. The graded areas away from structures will be at a minimum slope of 1 percent (LPGP 1998a). Design of the site drainage facilities will be performed in accordance with the Kern County Hydrology Manual. Drainage facilities will be designed for the flow resulting from a 10-year 24-hour rainfall. They will also be designed to prevent flooding of permanent plant facilities and overflow of plant roads during a 50-year, 24-hour storm. The flow of storm water from the site will be designed to generally follow the existing flow (LPGP 1998a, Appendix A).

The sanitary waste system will consist of a septic tank and leaching filed. The design will conform to the Kern County regulations and Uniform Plumbing Code. The total quantity of flow used in sizing will be calculated based on the total equivalent fixture units provided. The maximum anticipated amount of discharge to the septic system is 3,000 gpd (based on maximum potable water supply). Actual discharges would be less (LPGP 1998a).

INJECTION WELLS

La Paloma indicates continuous monitoring of injection pressure, flow rate, and cumulative volume of water injected will be conducted. Mechanical integrity testing will be performed every 5 years. Quarterly samples will be analyzed for physical/chemical and other relevant characteristics of injection fluids. Monthly reports will include the average, maximum, and minimum pressure, flowrate, and volume injected. No groundwater monitoring is proposed.

Energy Commission staff finds La Paloma's proposed mitigation measures for erosion and stormwater control to be complete and thorough. Staff recommended conditions of certification are to insure that these measures are properly implemented. For example, proposed conditions of certification require the project owner to provide copies of the erosion control and stormwater pollution prevention plans required by state and local regulations. In addition, recommended conditions require the project owner to file notices of intent for the General Industrial Stormwater Permit. La Paloma has already submitted the notice of intent required for the General Construction Activity Permit.

The California Department of Fish & Game (1998) has issued a streambed alteration permit for the proposed project. The agreement sets forth conditions to ensure the proposed project does not adversely effect fish and wildlife. The conditions enclosed in the agreement are consistent with those proposed in the Erosion and Stormwater Plan prepared by La Paloma (1998a, Data Resposne No. 20).

CONCLUSIONS AND RECOMMENDATIONS

Staff is not able to recommend approval of the proposed LPGP for the technical area of Soil & Water Resources at this time. This is because the staff has not completed an analysis of the project's conformity with SWRCB Policy 75-58. In addition, staff of the RWQCB have not been able to provide draft waste discharge requirements conditions yet. Once these conditions are provided, staff can

complete their analysis of this project component. Another issue is that agreements between DWR, WKWD and KCWA have not been completed regarding the proposed turnout. Furthermore, an agreement between these agencies regarding the WKWD placing groundwater into the aqueduct to meet any shortfalls in State Water Project deliveries has also not been completed.

CONDITIONS OF CERTIFICATION

SOILS&WATER 1: Prior to beginning any clearing, grading or excavation activities associated with project construction, the project owner will develop and implement a Storm Water Pollution Prevention Plan (SWPPP).

Verification: Two weeks prior to the start of construction, the project owner will submit to the Energy Commission CPM a copy of the Storm Water Pollution Prevention Plan (SWPPP).

SOILS&WATER 2: Prior to the initiation of any earth moving activities, the project owner shall submit an erosion control and revegetation plan for staff approval. The final plan shall contain all the elements of the draft plan with changes made to address the final design of the project.

Verification: The final erosion control and revegetation plan shall be submitted to the Energy Commission CPM for approval 30 days prior to the initiation of any earth moving activities.

SOIL&WATER 3: Sixty days prior to commercial operation, the project owner must submit a notice of intent to the State Water Resources Control Board to indicate that the project will operate under provisions of the General Industrial Activity Storm Water Permit. As required by the general permit, the project owner will develop and implement a Storm Water Pollution Prevention Plan (SWPPP).

Verification: Two weeks prior to the start of construction, the project owner will submit to the Energy Commission CPM a copy of the Storm Water Pollution Prevention Plan (SWPPP).

SOIL&WATER-4: The project owner shall provide a copy of the approved Underground Injection Control Permit from the EPA for the proposed injection wells to staff and notify the Energy Commission CPM of any changes to the permit.

Verification: Within thirty (30) days of receiving the Underground Injection Control Permit from the EPA, the project owner shall submit a copy to the Energy Commission CPM. The project owner shall notify the Energy Commission CPM in witting of any proposed changes to this permit, either initiated by the project owner or by the EPA. The project owner shall provide monitoring results as required by the EPA to the Energy Commission CPM in the annual compliance report.

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FACILITY DESIGN

Testimony of
Steve Baker, Kisabuli, Bob Anderson and Al McCuen

INTRODUCTION

The purpose of the Facility Design analysis is to verify that applicable laws, ordinances, regulations and standards (LORS) have been identified and that the project and ancillary facilities have been described in sufficient detail, including design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety.

This analysis also examines whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety, environmental protection or the operational reliability of the project. This analysis further establishes conditions of certification to ensure that a design review and construction inspection process will be employed that carries out the intent of the LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written decision ... which includes ... (a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety," and "(d)(1) Findings regarding the conformity of the proposed site and related facilities ... with public safety standards ... and with other relevant local, regional, state and federal standards, ordinances, or laws... (Pub. Resources Code, § 25523).

SUBJECTS DISCUSSED

Subjects covered in this analysis include:

- identification of the LORS applicable to facility design;
- evaluation of the applicant's proposed design criteria, including the identification of those which are essential to ensuring protection of the environment and/or public health and safety;
- proposed modifications and additions to comply with applicable LORS; and
- conditions of certification (COCs) proposed by staff to ensure that the project will be designed and constructed to comply with all applicable LORS, and protect environmental quality and assure public health and safety.

SETTING

La Paloma Generating Company, LLC (the applicant) is seeking approval from the California Energy Commission to construct and operate the La Paloma Generating Project (LPGP). The LPGP will be a natural gas-fired, nominal 1,048-megawatt (MW), and combined cycle powerplant. The project site is located in Western Kern County, about 40 miles west of Bakersfield, California. The powerplant will be sited on a 23 acre site, located near the intersection of Reserve Road and Skyline Road, about 1.5 miles east of McKittrick in the northeast corner of Township 30 South, Range 22 East (Diablo Base and Meridian). The LPGP site is in Seismic Zone 4, as delineated on Figure 16-2 of the 1998 California Building Code (CBC). Additional engineering details of the proposed project are contained in the Application for Certification (AFC), in Appendices A through I (LPGP 1998). It is expected that construction will last approximately 24 months, and the powerplant will enter commercial operation in the summer of 2001.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicable LORS proposed by the applicant are contained in the AFC, in Section 7 and Appendices A through I (LPGP 1998a).

ANALYSIS

The basis of this analysis is the applicant's proposed analysis methods, construction methods, and list of LORS, and design criteria, set forth in the AFC. Applicable engineering sections include:

Section 1.4 Project Schedule
Section 3.3 Site Description
Section 3.4 Facility Description
Section 3.5 Facility Civil/Structural Features
Section 3.6 Transmission Facilities
Section 3.7 Pipelines
Section 3.8 Project Construction
Section 3.10 Facility Closure
Section 5.3 Geological Resources
Appendices

1. Appendix A Foundations and Civil Engineering
2. Appendix B Structural and Seismic Engineering
3. Appendix C Mechanical Engineering
4. Appendix D Control Systems Engineering
5. Appendix E Electrical Engineering
6. Appendix F Major Equipment List
7. Appendix G Geotechnical Investigation
8. Appendix I Underground Injection Wells

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas line and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Appendix A for a list of the applicable industry standards), design practices, and construction methods in preparing and developing the site. The applicant's proposed methods follow industry standard practices. Staff concludes that the project is likely to comply with the applicable site preparation LORS, and proposes conditions of certification (below) to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly to repair or replace; or that require a long lead time to repair or replace; or those used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment are listed in the conditions of certification (below).

The AFC contains a list of the civil, structural, mechanical and electrical design criteria which demonstrate the likelihood of compliance with applicable LORS, and which staff believes are essential to ensuring that the project is designed in a manner which protects the environment and/or public health and safety.

PROPOSED MODIFICATIONS

The AFC (LPGP 1998a, Appendices A and B) identifies applicable LORS, which include the 1997 Uniform Building Code (UBC). Actual design and construction of the project could begin immediately after certification, or could be delayed for a period of time thereafter.

The project should be designed and constructed to the latest edition of the CBC (and other applicable codes and standards) in effect at the time design and construction of the project actually commence. The 1998 edition of the CBC should be available before this document goes to publication and it is expected that the LPGP will be designed to the 1998 CBC. In the event the design of the LPGP is submitted to the Chief Building Official (CBO)[1] for review when the successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions.

Staff can conclude that the LPGP will, in fact, be designed and constructed to the applicable facility design LORS. In order to provide assurance that this will occur as intended, staff proposes a condition of certification (**GEN 1**, below) to monitor compliance.

[1] CBO is the City or County Chief Building Official, his or her representative or the California Energy Commission's duly appointed representative.

DYNAMIC ANALYSIS

Structures, major equipment and large components of the facility can be structurally analyzed either statically or dynamically. While static analysis is often preferable due to its relative simplicity and cost effectiveness, it relies upon certain assumptions of regularity regarding the structural makeup of the item being analyzed. If the structure is regular, and not critical to safety or reliable plant operation, then static analysis may be adequate. If the structure is irregular, as are many power plant structures and components, or if the structure's integrity is critical to safety or reliable operation, then dynamic analysis may be in order.

Dynamic analysis is required to satisfy Section 1629.5 and Tables 16-L and 16-M (Configuration Requirements) of the 1998 CBC. The provisions of Sections 1629.8, 1629.9 and 1631 of the CBC should be used as a guide for design. Because of structural irregularity, the following major structures, equipment and components are likely to be subjected to dynamic analysis requirements of the 1998 CBC: Combustion turbine generator (CTG) pedestal and foundation, steam turbine generator (STG) pedestal and foundation, heat recovery steam generator (HRSG) structure and foundation, exhaust stack and foundation, and cooling tower. Other structures and components may also be candidates for dynamic analysis; see the list of major structures and equipment included in Proposed Condition of Certification **GEN-2** below. In order to ensure that those structures, components and pieces of equipment requiring dynamic analysis to comply with the code actually receive this treatment, staff proposes that the applicant and staff agree to a list of such items before design progresses. This requirement is incorporated in Proposed Condition of Certification **STRUC-1** below.

MECHANICAL SYSTEMS

Mechanical features of the project include four combustion turbine generators burning natural gas, with a dry-low NO_X combustor used to control NO_X; four heat recovery steam generators, dual pressure, unfired, reheat type; four steam turbine generators, condensing reheat type; feedwater system; two wet cooling towers; turbine inlet air cooling systems, evaporative type; water and wastewater treatment equipment; pressure vessels, piping systems and pumps; aqueous ammonia storage, handling and piping system; air compressors; fire protection systems; and heating, ventilating, air conditioning (HVAC), potable water, plumbing and sanitary sewage systems.

MECHANICAL LORS AND DESIGN CRITERIA

The AFC lists (Appendix C) and describes the mechanical codes, standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's mechanical systems are designed to the appropriate codes and standards. Staff has proposed conditions of certification (**MECH-1** through **MECH-4**, below) to monitor compliance with this requirement.

ELECTRICAL SYSTEMS

Major electrical equipment of the project include: four high voltage switchyard breakers with disconnect switches, 230 kV, 1,600 amp; four generator step-up transformers; two unit auxiliary transformers; and two generator circuit breakers. The project also includes power control wiring, protective relaying, grounding system, cathodic protection system and site lighting.

1) 230 kV Transmission Facilities. A 230 kV double-circuit transmission line is a direct intertie between the project switchyard and PG&E's Midway Substation near Buttonwillow. The transmission line will be about 13.6 miles long, and will be designed in accordance with California Public Utilities Commission's General Order (GO) 95 and other applicable state and local codes.

2) Power and Control Wiring. In general, conductors will be insulated on the basis of a normal maximum conductor temperature of 90ºC in 40ºC ambient air with a maximum emergency overload temperature of 130ºC and a short circuit temperature of 250ºC. In areas with higher ambient temperatures, larger conductors will be used or higher temperature rated insulation will be selected.

3) Protective Relaying. These relays protect equipment in the auxiliary power supply system, generator terminal systems, 230 kV system, 66 kV systems, turbine-generator system, and the electrical loads powered from these systems. The protective relaying scheme will be designed to remove or alarm any of the abnormal occurrences.

4) Classification of Hazardous Areas. Areas where flammable and combustible liquids, gases, and dusts are handled and stored will be classified for determining the minimum criteria for design and installation of electrical equipment to minimize the possibility of ignition. The criteria for determining the appropriate classification are specified in Article 500 of the National Electrical Code (NFPA/ANSI C1).

5) Grounding. The station grounding system will be an interconnected network of bare copper conductors and copper clad ground rods. The system will be provided to protect plant personnel and equipment from hazard, which can occur during power system faults and lightning strikes. The station-grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentrations.

6) Site Lighting. The site lighting system will provide personnel with illumination for the performance of general yard tasks, safety, and plant security. Power used to supply outdoor roadway and area lighting will be 208 or 480 volts.

7) Freeze Protection. A freeze protection system will be provided for selected outdoor piping as required. Parallel circuit type heating cable will be utilized where possible.

8) Cathodic Protection System. Consideration will be given to the need for cathodic protection and other corrosion control measures for all plant structures, including the exterior surface of underground piping and bottoms of surface mounted steel tanks.

The application lists (Appendix E) and describes the electrical codes; standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's electrical systems are designed to the appropriate codes and standards.

Staff concludes that the applicant can design the electrical systems in accordance with all LORS and in a manner which protects the environment and public health and safety by complying with the applicable LORS and electrical design criteria (LPGP 1998 AFC, Appendix E). Staff has proposed conditions of certification (**ELEC-1** and **ELEC-2**, below) to monitor this compliance.

ANCILLARY FACILITIES

TRANSMISSION LINE FACILITIES

The proposed project includes a double circuit, 13.6 mile long, 230 kV transmission line interconnecting to the existing PG&E Midway Substation near Buttonwillow. The transmission line will utilize single shaft, tubular steel poles.

PIPELINES

Potable Water Supply Line: The potable water supply pipeline will consist of a 6-inch diameter pipeline extending from a new tie-in at the existing West Kern Water District's supply pipeline in McKittrick to the proposed project site. The pipeline will be designed to withstand a pressure of 150 psi and will be approximately 9,000 feet long.

Natural Gas Supply Line: Natural gas will be delivered to the project site through a new 370-foot long steel pipeline, approximately 20-inches in diameter. The new pipeline will tie into the existing large diameter interstate gas pipeline, jointly owned by the Kern River Gas Transmission Company and the Mojave Pipeline Company. The natural gas pipeline will be buried (36-inch minimum cover). The pipeline will be coated with suitable material and cathodically protected against corrosion. The pipeline crossing of Reserve Road will be open cut.

Raw Water Supply Pipeline: Raw water will be supplied to the project from the Western Kern Water District. The water supply will require the construction of a water pumping station. The pipeline and pumping station will be constructed as part of the project. The pipeline will be approximately eight miles long and 24 inches in diameter. The pipeline is sized to deliver the anticipated peak flow of 5,000 gallons per minute and some additional flow if necessary.

GEOLOGIC HAZARDS

Staff, using professional experience with the project area, evaluated the applicant's geologic hazard discussions of the power plant site and linear corridors for ancillary facilities (LPGA 1998a, § 5.3). Geologic phenomena that staff assessed for the project area include seismic shaking, ground rupture due to surface faulting, liquefaction, hydrocompaction, landsliding, expansive soils, and design limitations due to subsurface mineral deposits. The principal geologic hazard at the site is seismic shaking.

SEISMIC SHAKING

The power plant site and ancillary facility corridors are located in California Building Code (CBC) Zone 4, the highest level of potential shaking in California, and are about 20 kilometers from the San Andreas Fault Zone, an "Active Fault Near-Source Zone" (Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada, 1998). To mitigate the seismic shaking potential, project facilities will be designed to Zone 4 requirements or greater.

SURFACE FAULTING

The nearest zoned active fault with surface rupture potential is the San Andreas Fault Zone located 20 kilometers west of the site (Fault Activity Map Of California and Adjacent Areas, 1994). No known active or potentially active faults cross either the plant area or any of the linear facility corridors.

LIQUEFACTION

Liquefaction of soils is a condition in which seismic shaking of relatively loose, cohesionless soils with the water table less than about 50 feet from the surface, can result in loss of shear strength and near-surface ground failure with subsequent loss of foundation bearing strength and/or differential settlement. The groundwater level in the project area is deeper than 50 feet from the ground surface.

HYDROCOMPACTION

Hydrocompaction, sometimes called soil collapse, is the process by which certain earth materials decrease in volume upon the addition of water. Alluvial silty sands at the power plant site to depths to about 6 to 8 feet indicate that hydrocompaction potential is low. However, to identify any areas of potential hydrocompaction, additional subsurface geotechnical investigations will be conducted prior to final design of power plant foundations, transmission line tower foundations and pipeline routes. Removal and recompaction of these soils is one type of mitigation of this hazard.

LANDSLIDING

The project area including the linear facilities is generally flat so landsliding potential is nil.

EXPANSIVE SOILS

Expansive soils, typically those containing montmorillonite or other similar high plasticity clays, exhibit shrinking and swelling characteristics with wetting and drying of those soils. The expansion and shrinking can cause ground movements beneath foundations. Preliminary subsurface soil testing shows that foundation soils at the power plant site are not potentially expansive. Additional studies will be conducted prior to final design of facilities to identify and mitigate any expansive soils that may be present in foundation areas.

MINERAL RESOURCES

Mineral resources occurring within the region include oil and diatomite. This project will not hinder further oil development because directional drilling could reach below any project facilities. However, the project and its linear facilities should be sited and routed to avoid impacting existing oil field facilities and any maintenance activities associated with them (see the **Land Use** section of this FSA and land use condition of certification **LAND-2**). There is a large amount of diatomite elsewhere in the region that could be mined, therefore, impacts to these deposits is insignificant.

PROJECT QUALITY ASSURANCE AND CONTROL

The AFC describes a Project Quality Assurance and Control Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with the technical codes and standards appropriate for a powerplant (LPGP 1998a, § 4.3.4). Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this QA/QC program will likely ensure that the project is designed, procured, fabricated and installed in accordance with LORS.

COMPLIANCE MONITORING

Staff has developed conditions of certification (see section below titled “Proposed Conditions of Certification”) to ensure that the design measures and LORS requirements are carried out in a manner that results in the protection of the environment and of public health and safety. Some of these facility design conditions address the roles, responsibilities and qualifications of engineers responsible for the design and construction of the project (proposed conditions of certification **GEN-1** through **GEN-9**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction proceeds without approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

CUMULATIVE IMPACTS

The subject area of Facility Design is not concerned with impacts upon the environment, but with compliance with applicable engineering LORS governing the design and construction of the physical facilities of the project. These include buildings and other structures, and related linear facilities such as pipelines and power transmission lines. The actual environmental impacts posed by these project features are dealt with elsewhere (e.g., under subject areas such as Biological Resources and Noise). Compliance with these engineering LORS creates no environmental impacts that could possibly extend offsite and accumulate with those of other, nearby projects. The area of Facility Design thus does not exhibit the potential to produce Cumulative Impacts.

FACILITY CLOSURE

A facility closure will be evaluated under three scenarios. Planned Closure, Unexpected Temporary Closure and Unexpected Permanent Closure.

PLANNED CLOSURE

The removal of the facility from service, or decommissioning, may range from "mothballing" to removal of all equipment and appurtenant facilities, depending on conditions at the time. Future conditions that may affect the decommissioning decision are largely unknown at this time. The applicant should provide the details of a "planned closure" plan to Kern County and the Energy Commission.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission and Kern County for review and approval prior to commencement of the decommissioning. The plan shall include a discussion of:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

UNEXPECTED TEMPORARY CLOSURE

Under this scenario, it is expected that the facility is closed unexpectedly, on a short-term basis. Natural disasters, such as an earthquake or severe storm, can

cause an unexpected temporary closure of the facility. If damage to the facilities is too great, the temporary closure may become permanent.

If the facility is closed on a temporary basis, the applicant shall secure the site in order to protect public health and safety. If temporary closure becomes permanent, the applicant shall follow the "Planned Closure" procedures outlined above.

UNEXPECTED PERMANENT CLOSURE

Under this scenario, the project owner closes the facility unexpectedly on a permanent basis. In this case, the project owner shall implement the closure procedures outlined above for "Planned Closure". In the case where the project is abandoned, the property owner shall be responsible for implementing the closure procedures outlined above.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. To ensure that these measures are included in the Facility Closure Plan, a Condition of Certification (**GEN-9**) is proposed below.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents, and included herein, are those applicable to the project.

2. Staff has evaluated the AFC, and the project LORS and design criteria in the record. Staff concludes that the design, construction and eventual closure of the project can comply with applicable LORS. If properly implemented, design criteria, including staff proposed modifications, will ensure that LORS are met during the project design and construction.

3. The conditions of certification proposed below will ensure that the proposed facilities are designed, constructed, operated and eventually closed in accordance with applicable LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the local CBO or other commission delegate agent. Staff will audit the CBO or delegate agent to ensure satisfactory performance.

RECOMMENDATIONS

If the commission certifies the project, staff recommends that:

1. the project be designed and built to the most recently adopted edition of all applicable LORS in effect at the time that project design and procurement commences, including the latest edition of the CBC[2] or its successor standard;

2. the conditions of certification proposed herein be adopted to ensure that the project is designed and constructed to protect environmental quality, assure public health and safety, and comply with applicable LORS;

3. the CBO review the final designs, conduct plan checking and perform field inspections during construction; and staff audit and monitor the CBO to ensure satisfactory performance; and

4. transmission lines should be routed to avoid impacting existing oil field facilities and any maintenance activities associated with them.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the California Building Code (CBC)[3] and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission, and published at least 180 days previously.

In the event, the LPGP is designed to a successor edition to the 1998 CBC; the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions.

Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

[2] 1998 CBC or later. Conditions of certification presented herein are based on the 1998 CBC, including references to specific sections, tables and coefficients. If the project is designed and built to a successor standard, the 1998 CBC specific references may need to be modified to the successor standard.

[3] All the Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).

Verification: Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Commission's Decision have been met for facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy in the next Monthly Compliance Report after receipt of the permit from the CBO [1998 CBC, Section 109 – Certificate of Occupancy.]

GEN-2 The project owner shall furnish to the California Energy Commission Compliance Project Manager (CPM) and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and equipment below). To facilitate audits by commission staff, the project owner shall provide designated packages to the CPM when requested.

FACILITY DESIGN Table 1
Major Equipment List

Quantity	Description	Size/Capacity	Remarks
4	Combustion Turbine (CT)	172 MW	Dry low NoX combustion control and starter package.
4	Steam Turbine	96 MW	Condensing rehear type.
4	Generator	300 MVA	Hydrogen cooling system.
4	CT inlet filter	640,000 CFM	
4	Heat Recovery Steam Generator (HRSG)	480,587 lb./hr.	HP and LP.
4	HRSG Stack	18'-6" dia.X100' high	Steel stack.
1	Aqueous ammonia	45,000 gal.	Ammonia storage tank.
1	Fire/service	600,000 gal.	Water storage tank.
1	Demineralized water	180,000 gal.	Demineralized water storage tank.
4	Circulating water pumps	55,000 gpm	
1	Water storage reservoir tank	700,000 gal.	Welded steel storage reservoir.
2	Wet cooling towers	590 mm Btu/hr.	
4	Step-up transformers	18/230 kV	To electrical grid.

FACILITY DESIGN Table 2
Major Structures, Equipment and Associated Foundations

Quantity	Description	Dimensions (ft)		
		Length	Width	Height
4	Combustion gas turbine generator and starter package (CT).	50	45	20
4	CT air inlet filter with air cooling system.	100	20	35
4	Generator with enclosure.	40	20	25
4	Hear Recovery Steam Generator (HRSG).	130	45	65
4	HRSG stack.		18.5 dia.	100
4	Selective catalytic reduction skid (SCR).	20	15	10
4	Steam turbine pedestal w/turbine and condenser.	45	50	30
4	Auxiliary transformer	45	45	25
4	Step-up transformer.	45	30	25
1	Demineralized water storage tank.		40 dia.	20
1	Fire/Service water storage tank.		60 dia.	30
1	Aqueous ammonia storage tank.		26 dia.	12
2	Wet cooling tower.	230	65	40
1	Water storage reservoir		74 dia.	24
1	Free-standing communication tower			30
1	Switchyard buses and towers.	700	230	35
1	Electrical/control building.	60	80	20
1	Switchyard control building.	20	20	14
1	Administration building.	30	60	12

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The project owner shall provide schedule updates in the Monthly Compliance Report.

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection, equivalent to the fees listed in the 1998 CBC, Chapter 1, Section 107 and Table 1-A – Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A – Grading Plan Review Fees, and Table A-33-B – Grading Permit Fees. If Kern County has adjusted the CBC fees for design review, plan check and construction inspection, the project owner shall pay the adjusted fees.

Verification: The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fee has been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project. [Building Standards Administrative Code (Cal. Code of Regs., Tit. 24, § 4-209 – Designation of Responsibilities).

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

Protocol: The RE shall:

1. monitor construction progress to ensure compliance with LORS;

2. ensure that construction of all the facilities, conforms in every material respect, to the applicable LORS, approved plans, and specifications;

3. prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;

4. be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

5. be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and

6. be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer who is either a structural engineer or a civil engineer who is fully competent and proficient in the design of power plant structures and equipment Supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code, Section 6704 et seq., and sections 6730 and 6736. Requires state registration to practice as a civil engineer or structural engineer in California.]

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g. proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. [1998 CBC, section 104.2 – Powers and Duties of Building Official.]

If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Protocol: A: The civil engineer shall:

1. design (or be responsible for design), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities. At a

minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and

2. provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures.

Protocol: B: The geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering:

1. review all the engineering geology reports, and prepare final soils grading report;

2. prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;

3. be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, Section 3317 – Grading Inspections;

4. recommend field changes to the civil engineer and RE;

5. review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and

6. prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18, Section 1804 – Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations. [1998 CBC, Section 104.2.4 – Stop orders.]

Protocol: C: The design engineer shall:

1. be directly responsible for the design of the proposed structures and equipment supports;

2. provide consultation to the RE during design and construction of the project;

3. monitor construction progress to ensure compliance with LORS;

4. evaluate and recommend necessary changes in design; and

5. prepare and sign all major building plans, specifications and calculations.

Protocol: D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission Decision.

Protocol: E: The electrical engineer shall:

1. be responsible for the electrical design of the project; and

2. sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701 – Special Inspections and Section – 1701.5 Type of Work (requiring special inspection), Section 106.3.5 – Inspection and observation program.

Protocol: The Special Inspector shall:

1. be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. observe the work assigned for conformance with the approved design drawings and specifications;

3. furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM; and,

4. submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector [certified American Welding Society (AWS) and/or American Society of Mechanical Engineers (ASME) as applicable] shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 The project owner shall keep the CBO informed regarding the status of construction. If any discrepancy between design and construction is discovered during construction, the project owner shall prepare and submit a non-conformance report (NCR) describing the nature of the discrepancy to the CBO. The NCRs shall reference this condition of certification, and applicable sections of the applicable edition of the CBC.

Verification: The project owner shall submit monthly construction progress reports to the CBO and CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings. [1998 CBC, Section 108 – Inspections.]

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans.

GEN-9 The project owner shall file a closure/decommissioning plan with the CPM and Kern County for review and approval at least 12 months (or other mutually agreed to time) prior to commencing the closure activities.

Protocol: The closure plan shall include a discussion of the following:

1. the proposed closure/decommissioning activities for the project and all appurtenant facilities constructed as part of the project;

2. all applicable LORS, all local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;

3. activities necessary to restore the site if the decommissioning plan requires removal of all equipment and appurtenant facilities; and

4. closure/decommissioning alternatives, other than complete restoration of the site.

Verification: At least 12 months prior to closure or decommissioning activities, the project owner shall file a copy of the closure/decommissioning plan with Kern County and the CPM for review and approval.

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the CPM (the functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license).

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit to the CBO for approval, the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CBO approval is needed. The CBO will approve or disapprove of the engineering geologist(s) and will notify the project owner and CPM of its findings within 15 days of receipt of the submittal.

If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual to the CBO and CPM. The CBO will approve or disapprove of the engineering geologist(s) and will notify the project owner and the CPM of the findings within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4 – Engineered Grading Requirement, and Section 3318.1 – Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.

2. Monitor geologic conditions during construction.

3. Prepare the Final Geologic Report.

Protocol: The Engineering Geology Report required by the 1998 CBC, Appendix Chapter 33, Section 3309.3 Grading Designation, and shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy, for the intended use, of the site as affected by geologic factors.

The Final Geologic Report to be completed after completion of grading, as required by the 1998 CBC, Appendix Chapter 33, Section 3318.1, and shall contain the following: A final description of the geology of the site and any new information disclosed during the grading and the effect of same on recommendations incorporated in the approved grading plan. Engineering geologists shall submit a statement that, to the best of their knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Geologic Report required by the 1998 CBC, Appendix Chapter 33, Section 3318 Completion of Work, to the CPM and the CBO.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. design of the proposed drainage structures and the grading plan;

2. an erosion and sedimentation control plan;

3. related calculations and specifications, signed and stamped by the responsible civil engineer; and

4. soils report as required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report and Section 3309.6 – Engineering Geology Report.

Verification: At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and

construction in the affected area. [1998 CBC, Section 104.2.4 – Stop orders.]

Verification: The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.

CIVIL-3 The project owner shall perform inspections in accordance with the 1998 CBC, Section 108 – Inspections, Chapter 17, Section 1701.6 – Continuous and periodic special inspection and Appendix Chapter 33, Section 3317 – Grading inspection. All plant site-grading operations shall be subject to inspection by the CBO and the CPM.

If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs for the reporting month shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities. [1998 CBC, Section 109 – Certificate of Occupancy.]

Verification: Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit to the CBO for review and approval the applicable designs, plans and drawings, and a list of those project structures, components and major equipment items that will undergo dynamic structural analysis. Designs, plans and drawings shall be those for:

1. major project structures;

2. major foundations, equipment supports and anchorage;

3. large field fabricated tanks;

4. turbine/generator pedestal; and

5. switchyard structures.

Protocol: The project owner shall:

1. obtain agreement with the CBO on the list of those structures, components and major equipment items to undergo dynamic structural analysis;

2. meet the pile design requirements of the 1998 CBC. Specifically, Section 1807 – General Requirements, Section 1808 – Specific Pile Requirements, and Section 1809 – Foundation Construction (in seismic zones 3 and 4);

3. obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications, [1998 CBC, Section 108.4 – Approval Required];

4. submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation, [1998 CBC, Section 106.4.2 – Retention of plans and Section 106.3.2 – Submittal documents.]; and

5. ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed

and stamped by the responsible design engineer. [1998 CBC, Section 106.3.4 – Architect or engineer of record.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following:

1. concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);

2. concrete pour sign-off sheets;

3. bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);

4. field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number [ref: AWS]; and

5. reports covering other structure activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701 – Special Inspections, Section 1701.5 – Type of Work (requiring special inspection), Section 1702 – Structural Observation and Section 1703 – Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2 – Submittal documents, and Section 106.3.3 – Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 California Building Code (CBC) shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC. Chapter 16, Table 16–K of the 1998 CBC requires use of the following seismic design criteria: $I = 1.25$, $I_p=1.5$ and $I_w=1.15$.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM

in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping system (exclude: domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter equal to or less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction. [1998 CBC, Section 106.3.2 – Submittal documents, Section 108.3 – Inspection Requests.]

Protocol: The responsible mechanical engineer shall submit a signed and stamped statement to the CBO when:

Protocol: the proposed final design plans, specifications, and calculations conform with all of the piping requirements set forth in the Commission Decision; and

Protocol: all of the other piping systems, except domestic water, refrigeration systems, and small bore piping, have been designed, fabricated, and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code); and
- Specific City/County code.

The CBO may require the project owner, as necessary, to employ special inspectors to report directly to the CBO to monitor shop fabrication or equipment installation. [1998 CBC, Section 104.2.2 – Deputies.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the proposed final design plans, specifications, calculations and quality control procedures for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Commission Decision. The project owner shall transmit a

copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation. [1998 CBC, Section 108.3 – Inspection Requests.]

The project owner shall:

1. ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and

2. have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications, and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of the CBO plan check approvals to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's and/or Cal-OSHA inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations, and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

Verification: The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings, and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS. [1998 CBC, Section 108.7 Other Inspections; Section 106.3.4 – Architect or engineer of record.]

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of CBO comments and approvals to the CPM in the next Monthly Compliance Report. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-4 Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction. [1998 CBC, Section 108.3 – Inspection Requests, Section 108.4 – Approval Required.]

The project owner shall design, fabricate, and install:

1. plumbing, potable water, all drainage systems, toilet rooms, in accordance with Title 24, California Code of Regulations, Division 5, Part 5, and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and

2. building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Division 5, Chapter 2-53, Part 2.

The final plans, specifications, and calculations shall clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications, and calculations conform with all of the requirements set forth in the Commission Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any of the above systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

ELEC-1 For the 13.8 kV and lower systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. [1998 CBC, Section 108.4 – Approval Required, and Section 108.3 – Inspection Requests.]

Protocol: The following activities shall be reported in the Monthly Compliance Report:

1. receipt or delay of major electrical equipment;

2. testing or energization of major electrical equipment; and

3. the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

ELEC-2 The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C: [CBC 1998, Section 106.3.2 – Submittal documents.]

A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems;
2. system grounding drawings;
3. general arrangement or conduit drawings; and
4. other plans as required by the CBO.

B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements;
7. lighting energy calculations; and
8. other reasonable calculations as customarily required by the CBO.

C. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Commission Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for the items enumerated above, including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

California Department of Conservation, Division of Mines and Geology, Published by International Conference of Building Officials, Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada [to be used with the 1997 Uniform Building Code], Publication date listed in error as February, 1988. Actual publication date is February 1998.

Jennings, C.W., Fault Activity Map of California and Adjacent Areas, California Department of Conservation, Division of Mines and Geology, 1994.

LPGP (La Paloma Generating Project). 1998a. Application for Certification, La Paloma Generating Project (98-AFC-2). Submitted to the California Energy Commission, August 12.

LPGP (La Paloma Generating Project). 1998b. Phase I: Environmental Site Assessment, La Paloma Power Plant, and Kern County, California. Submitted to the California Energy Commission, July 10.

LPGP (La Paloma Generating Project). 1998. Application for Certification, addendum I, La Paloma Generating Project (98-AFC-2). Results of the La Paloma Route I Survey for Cultural and Paleontological Resources from MP 13.6 (Confidential). Submitted to the California Energy Commission, August 13.

LPGP (La Paloma Generating Project). 1998. Application for Certification, addendum II, La Paloma Generating Project (98-AFC-2). Supplemental Material to Applicant's AFC – Biological Assessment Report. Submitted to the California Energy Commission, October 27.

LPGP (La Paloma Generating Project). 1998. Application for Certification, addendum III, La Paloma Generating Project (98-AFC-2). Errata to the AFC. Submitted to the California Energy Commission, October 29.

LPGP (La Paloma Generating Project). 1998. Application for Certification, addendum IV, La Paloma Generating Project (98-AFC-2). A supplement that presents minor modifications and clarifications to the AFC. Submitted to the California Energy Commission, October 29.

LPGP (La Paloma Generating Project). 1998. Response CEC data requests, La Paloma Generating Project (98-AFC-2). Submitted to the California Energy Commission, November 3.

PALEONTOLOGICAL RESOURCES

Testimony of Robert Anderson

INTRODUCTION

Construction, operation and closure of a power plant and related features may impact paleontological resources within disturbed soil and/or rock areas. Energy Commission staff have conducted an analysis of the paleontological resource assessment and mitigation measures proposed by the La Paloma Generating Company, LLC. (La Paloma) for the La Paloma Generating Project (LPGP). The objective of staff is to ensure that there will be no adverse impacts to significant paleontological resources during project construction, operation and closure. The section concludes with staff's support of the proposed monitoring and mitigation measures with respect to paleontological resources, with the inclusion of eight conditions for certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

La Paloma assessed the applicability of the following Laws, Ordinances, Regulations and Standards (LORS) with respect to assessment and mitigation of paleontological resources for the LPGP. The LORS applicable to the project with respect to paleontological resources monitoring and mitigation include the following:

FEDERAL

The National Environmental Policy Act (NEPA): Title 42, United States Code sections 4321-4327. This legislation established the basis for the nation's environmental policies. Paleontological resources are considered items of scientific interest under NEPA.

Federal Land Management and Policy Act (FLMPA): Title 43, United States Code sections 1701-1784 requires that public land be managed in such a way that the quality of items of scientific interest (including paleontological resources) are protected.

NEPA and the FLMPA apply to the transmission line alignments and rights-of-way that cross land under the jurisdiction of the Bureau of Land Management (BLM). It is noted that the BLM has guidelines (BLM 1969) for assessing and managing paleontological resources on public lands under their jurisdiction.

STATE

CEQA Guidelines, Title 14, California Code of Regulations, Section 15000 et seq., Appendix G, (V)(c) are applicable to the site since the proposed project is located in California and not on a federal reservation or tribal lands (with the exception of a small portion of a transmission line alignment that crosses BLM land).

In addition to the CEQA guidelines, the Energy Commission has regulations pertinent to paleontological resources assessment and management. These regulations are found in Title 20, California Code of Regulations, Division 2, Chapter 5, Article 6, Appendix B, (g)(16).

LOCAL GUIDELINES OR ORDINANCES

None apply to the project.

STANDARDS

The Society of Vertebrate Paleontologists (SVP) *Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures*, dated 1994 are applicable to the project. The Standard Procedures call for the assessment and mitigation program to be developed by a paleontologist.

SITE SETTING

The site is located in the southeastern portion of the McKittrick Valley. A description of the regional and site specific geologic setting, of the proposed power plant, natural gas supply pipeline, electrical transmission lines, raw water pipeline, potable water pipeline, and sewer connection is presented in the paleontological resources section of the application (LPGP 1998a, AFC § 5.8). A map showing the location of known fossil locations in the vicinity of the proposed project is also included in Appendix M, Map M-1(LPGP 1998f).

There are three geologic units in the vicinity of the project that are of interest with respect to paleontological resources. The units are alluvium, tar seeps in alluvium, and the Tulare Formation. In general, the power plant footprint and the majority of the transmission lines, pipelines, and related features are located on alluvium (sands, silts, and gravel). The alluvium has produced some significant fossils in the Bakersfield area, but no fossil locations are known to exist within the footprint of the power plant. Tar seeps are also present in the vicinity of the project and especially near the proposed alignment for the natural gas supply pipeline route. The tar seeps are significant since similar seeps in the area have produced numerous high quality vertebrate and invertebrate fossils. A third geologic unit of high paleontological significance is the Tulare Formation. The Tulare Formation has produced high quality vertebrate fossils at several locations in Kern County. Fossils of squirrels, rabbits, and lizards have been found at a location along water supply line route 2.

LITERATURE AND ARCHIVES SEARCH, AND FIELD SURVEY RESULTS

La Paloma retained Woodward-Clyde and their subcontractor, Mr. David Lawler, a paleontologist, to conduct a paleontological assessment of the proposed power plant, and proposed routes for the related natural gas supply pipeline, electrical transmission line, raw water pipeline, potable water pipeline, sewer connection and water storage reservoir. The paleontologist had a literature search performed,

visited several archives, and conducted two paleontological site surveys. Several locations containing fossils were identified along the proposed water pipelines, and near the water storage reservoir. Fossil locations are suspected, but have not been observed in or adjacent to the tar seeps along the proposed gas pipeline (route 5). According to La Paloma, none of the sites encountered are deemed significant enough to stop or alter the proposed project, given the mitigation measures proposed by La Paloma. It should be noted that the Tulare Formation can be found over large areas in Kern, Kings, and San Louis Obispo Counties.

IMPACTS

SITE SPECIFIC IMPACTS

Several small, isolated fossil locations along the proposed 230 kV electrical transmission line (route 1), alternate water supply lines (routes 2 and 3) and near the proposed water storage reservoir were noted by La Paloma's paleontologist during the paleontological field surveys. No fossil locations are known to exist within the foot print of the proposed power plant. Given the high sensitivity of vertebrate fossils in the area, it is possible that paleontological resources may be impacted by clearing and grubbing, grading, and/or excavating native soil or rock. Staff's analysis of the probability that a significant paleontological resouce (fossil or trace fossil) will be encountered during grading and excavation of the site is low in the allivum, high in the tar seeps, and moderate to high in the Tulare Formation. It is staff's assessment that direct, and indirect adverse impact on paleontological resources by construction, operation and closure of the LPGP is likely to be insignificant if La Paloma follows the proposed conditions of certification.

CUMULATIVE IMPACTS

The nearby Sunrise Cogeneration and Power Project area also contains alluvium and the Tulare Formation geologic units, but is not known to have tar seeps. It is staff's assessment that cumulative adverse impact on paleontological resources by construction, operation and closure of the LPGP is likely to be insignificant if La Paloma follows the proposed conditions of certification.

MITIGATION

Based upon the literature and archives search, and the field surveys, La Paloma proposed monitoring and mitigation measures to be followed during the construction of the power plant, related natural gas supply line, electric transmission line, water pipelines and the water storage reservoir. La Paloma has indicated that there is a high probability that vertebrate fossils may be encountered during construction of the power plant and related features. The mitigation measures proposed by La Paloma are listed in section 5.8.3 of the application for certification (LPGP 1998a, AFC § 5.8) include those derived from adoption of the guidelines of the Society of Vertebrate Paleontologists. Implementation of the guidelines will help ensure the timely assessment and management of paleontological resources, should they be encountered during construction or operation of the facility. Staff agrees with those

mitigation measures. The proposed conditions of certification are to allow the Commission Compliance Manager and La Paloma to adopt a compliance monitoring scheme that will ensure LORS applicable to paleontological resource management for the proposed project are adequately addressed.

FACILITY CLOSURE

Facility closure activities are not anticipated to impact paleontological resources unless closure activities include grading and excavation.

CONCLUSION AND RECOMMENDATIONS

Staff's analysis of the proposed project indicates that even though minor areas of the site are known to contain paleontological resources, the proposed project should not adversely impact the resources. The proposed assessment and mitigation program is similar to other successful program that staff observed in San Bernardino and Riverside Counties. Staff recommend that the proposed conditions of certification with respect to monitoring and mitigation of paleontological resources be adopted. The LPGP will be able to comply with applicable LORS and have no adverse impact with respect to paleontological resources with the adoption of the proposed conditions of certification listed below.

PROPOSED CONDITIONS OF CERTIFICATION

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resources specialist approved by the Energy Commission Compliance Project Manager (CPM) is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resources specialist.

1) The statement of qualifications for the designated paleontological resource specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

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

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

4) If the approved, designated paleontological resources specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resources specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontological resources specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

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

Verification: At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed throughout project construction.

Protocol: In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists, as modified in the Application for Certification for the La Paloma Generating Project, dated July 1998 (revised

November 1998), the project owner is to adopt and implement the BLM's *General Procedural Guidance Manual for Paleontological Resource Management* for those sections of the project deemed by the BLM to be under their jurisdiction. When the guidelines overlap, the project owner is to follow the more stringent guideline. The Paleontological Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

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

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

3) Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring.

4) An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined.

5) A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits.

6) Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources.

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

Verification: At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resources specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of project construction, the designated paleontological resources specialist shall prepare and conduct an employee training program for all site workers The project owner shall submit the paleontological resources training program to the CPM for review and approval.

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

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

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

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resources specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

PAL-4 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall provide the CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Verification: Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the

designated paleontological resources specialist shall present the CPM-approved paleontological resources training program. The project owner shall provide documentation to the CPM in the Monthly Compliance Report that the employee training and the set of procedures have been provided to all project managers, construction supervisors, and to all workers. Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-5 The designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified.

If the designated paleontological resources specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-6 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Final Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resources specialist. The Paleontological Resource Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resources specialist that project impacts to paleontological resources have been mitigated.

Verification: The Paleontological Resources Report shall be submitted under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resources specialist within 90 days following completion of the analysis of the recovered fossil materials. The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval.

PAL-8 The project owner shall include a description regarding closure activity's potential to impact paleontological resources in the facility closure plan. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the facility.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

REFERENCES

BLM (Bureau of Land Management). 1969 (revised July 1998). Handbook H-8270-1, General Procedural Guidance for Paleontological Resource Management. Washington, D.C.

LPGP (La Paloma Generating Project). 1998a. Application for Certification, La Paloma Generating Project (98-AFC-2). Submitted to the California Energy Commission, August 26.

LPGP (La Paloma Generating Project). 1998f. Paleontological Resources confidentail filing. Submitted to the California Energy Commission, July 10.

SVP (Society of Vertebrate Paleontologists). 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures. October.

POWER PLANT RELIABILITY

Testimony of Steve Baker

INTRODUCTION

In this analysis, staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Such a level of reliability is selected as a benchmark because the resulting project would likely not degrade the overall reliability of the electric system it serves, and because no special reliability requirements pertain to the project.

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While the applicant has predicted a level of reliability for the power plant (see below), staff believes the applicant should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system.

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin"." This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or transmission facilities. The utilities generally maintained a seven- to ten-percent reserve margin, meaning that sufficient capacity was on call to quickly replace from

seven to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

Now, in the newly restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), a newly-formed entity that will work with the California Power Exchange to purchase, dispatch and sell electric power throughout the state. How Cal-ISO will ensure system reliability is not yet thoroughly understood; protocols are now being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms currently being considered to ensure an adequate supply of reliable power (Mavis 1998, pers. comm.).

These mechanisms apparently are being devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures will act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry have become accustomed.

The applicant proposes to operate the project as a baseload unit, providing maximum electrical output during the summer and winter peak demand periods (LPGC 1998, AFC §§ 1.6, 3.9.2.2) at an availability factor above 90 percent (LPGC 1998, AFC §§ 3.9.2, 4.3.1). The applicant speaks of no plans to sell reliability-related power services, such as voltage support or spinning reserve. In the new competitive electric power industry, if such service were desired, the market would put a price on that service. If the price were high enough, the applicant or others would move to serve the need. Since the project does not profess to provide voltage support, spinning reserve or other reliability-related services, staff proposes to place no special reliability requirements on it.

ANALYSIS

A reliable power plant is one that is available when called upon to operate. Achieving this reliability is accomplished by ensuring equipment availability, plant maintainability, fuel and water availability, and adequate resistance to natural hazards.

Throughout its intended life, the project will be expected to perform reliably in baseload duty. Such plants are expected to provide uninterrupted service for very long durations. Baseload power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. This requirement for equipment availability is typically addressed by control of quality in machinery design, construction and installation. Plant reliability is further assured by providing for plant maintainability and sufficient redundancy of critical equipment, fuel and water availability, and resistance to natural hazards.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant; by procuring equipment from qualified vendors and suppliers; and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

QA/QC PROGRAM

The QA/QC program delineated by the applicant (LPGC 1998, AFC § 4.3.4) describes a program typical of the power industry. Project designs and procurement specifications will be checked by qualified reviewers; equipment and supplies will be purchased from qualified suppliers and will be inspected upon receipt; and construction and installation will be inspected and systems tested, all in accordance with the QA plan. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

QUALIFIED VENDORS AND SUPPLIERS

Vendors of plant equipment and materials will be selected from lists of qualified suppliers, those with known capabilities. To appear on the list of qualified suppliers, a vendor must show satisfactory personnel qualifications, production capability, past performance, and quality assurance program (LPGC 1998, AFC § 4.3.4.2). Procured items will be subjected to an inspection and audit process that ensures the expected quality. This describes an industry standard approach to vendor selection, which staff expects to lead to the acquisition of quality, reliable equipment and materials.

PLANT MAINTAINABILITY

EQUIPMENT REDUNDANCY

A generating facility called on to operate in baseload service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

The applicant plans to provide some redundancy of function (LPGC 1998, AFC § 4.3.2; Appendix F). For example:

- The following plant components are provided in sets of two 100 percent capacity units per generating train:

  - HRSG feed pumps;
  - condensate pumps; and
  - condenser mechanical vacuum pumps.

- The following plant components are provided in sets of two 50 percent capacity units per generating train:

  - circulating water pumps[1]; and
  - auxiliary cooling water pumps.

- The plant's service air and control air needs will be served by two 100 percent capacity air compressors and two 100 percent capacity air dryers.

- The computerized control and protective system for the gas turbine generators, steam turbine generator and HRSGs, known as the Distributed Control System (DCS), will exhibit typical redundancy (LPGC 1998, AFC §§ 3.9.2.3 - 3.9.2.7, 4.3.2.3). Backup power supply will be via an uninterruptible power supply utilizing batteries and a diesel generator (LPGC 1998, AFC §§ 3.4.5.3 - 3.4.5.5).

While some power plants exhibit slightly greater levels of equipment redundancy, the fact that the project consists of four parallel trains of gas turbine generators/HRSGs/ steam turbine generators provides inherent reliability. Failure of a non-redundant component of one train should not cause the other trains to fail, thus allowing the plant to continue to generate (at reduced output). If such a failure occurs, that generating train must be shut down until repairs or replacement can be effected (LPGC 1998, AFC § 4.3.2.1). With this opportunity for continued operation in the face of equipment failure, staff believes that the equipment redundancy described here represents an adequate design approach for a project such as this.

MAINTENANCE PROGRAM

The applicant proposes to establish a plant maintenance program typical of the industry in accordance with documented procedures (LPGC 1998, AFC §§ 4.3.1.1, 4.3.4.3). In conjunction with an overall plant quality control program (LPGC 1998, AFC § 4.3.4), staff expects that this will allow the project to be adequately maintained to ensure acceptable reliability.

1 Loss of a single 50 percent capacity circulating water pump typically allows the steam cycle portion of the generating train to continue operating near 65 percent capacity. Since the steam cycle accounts for only 1/3 of the output of a combined cycle train, overall capacity with loss of one circulating water pump would drop only to about 90 percent of full load for that train. The impact on the four-train plant would be negligible.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

FUEL AVAILABILITY

Fuel (natural gas) will be supplied to the project from the Kern River Gas Transmission Company/Mojave Pipeline Company interstate gas line by a 370 foot-long, twenty-inch diameter gas pipeline (LPGC 1998, AFC §§ 1.5.5, 3.7.1). The applicant plans to pursue a portfolio approach to securing gas supplies from suppliers in the Rocky Mountains, the Southwest, and Canada, and will investigate further alternatives, including PG&E, SoCalGas and the Elk Hills Petroleum Reserve (LPGC 1998, AFC § 4.3.3). Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

WATER SUPPLY RELIABILITY

Water will be used in the power plant chiefly for steam turbine condenser cooling, and to feed the gas turbine generators' evaporative inlet air coolers. Raw water will be supplied from the California Aqueduct through the West Kern Water District via a new 8.6 mile-long, 24-inch diameter pipeline and aqueduct turnout and pumping station. Potable water will be supplied by the West Kern Water District via a new 1.7 mile-long, 6-inch diameter pipeline (LPGC 1998, AFC §§ 1.5.6, 3.4.7, 3.7.2 - 3.7.4, 3.9.4). The project's water consumption represents only a portion (22 percent) of the Water District's aqueduct allotment and an even smaller portion (2.5 percent) of its banked groundwater reserves (LPGC 1998, AFC §§ 1.5.6, 4.3.5). Staff regards this as an adequately reliable supply. (Please refer to that portion of this document entitled **Soil and Water Resources**.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but seismic shaking (earthquake) and flooding present credible threats to reliable operation (see that portion of this document entitled **Facility Design**).

SEISMIC SHAKING

The nearest known earthquake faults lie five and twelve miles distant (LPGC 1998, AFC § 3.3.2.2). The applicant commits to designing and constructing the facility to the latest appropriate LORS (LPGC 1998, AFC §§ 1.7, 1.8.2, 4.1.1.1; Appendix B, §§ B.3.1, B.3.4, B.5.1). Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. (Please see that section of this document titled **Facility Design**.) By virtue of being built to the latest seismic design LORS, this project will likely perform

at least as well as, and perhaps better than, existing plants in the electric power system. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

FLOODING

The project will not be located near active flood hazards; the entire site lies outside of any 100-year floodplains. The project will be designed to prevent flooding of permanent facilities and roads in a 25-year storm (LPGC 1998, AFC § 4.1.1.2; Appendix A, § A.3.3.3). Staff deems this adequate protection from flooding. (Please see that section of this document titled **Facility Design**.)

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (www.nerc.com). NERC reports the following summary generating unit statistics for the years 1992 through 1996 (NERC 1997):

For Simple Cycle Gas Turbine units (over 50 MW)
Availability Factor = 89.76 percent

For Combined Cycle units (of all sizes)
Availability Factor = 90.48 percent

For all Gas Turbine units (of all sizes)
Availability Factor = 90.11 percent

The ASEA Brown Boveri GT 24 gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an availability factor greater than 90 percent (LPGC 1998, AFC § 4.3.1) agrees with the NERC figure (90.48 percent) for similar plants throughout North America (see above). Further, since the plant will consist of four parallel generating trains, maintenance can and will be scheduled during those times of year when the full plant output is not required to meet market demand (LPGC 1998, AFC § 4.3.1.1). This practice holds out the promise of adequately high plant availability. The applicant's estimate of plant availability therefore appears quite realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in step with industry norms, and staff believes they are likely to yield an adequately reliable plant.

CUMULATIVE IMPACTS

The reliability, or lack thereof, of this project cannot be affected by the reliability of any other nearby projects. Likewise, this project's reliability cannot affect that of other nearby projects. Since this project is expected to be built to normal industry standards of power plant reliability, staff believes the potential for cumulative electric system reliability impacts is nil. Any system reliability impacts that might accrue from multiple nearby power plant projects are dealt with in that portion of this document called **Transmission System Engineering**.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact project reliability. Reliability impacts on the electrical system from facility closure, should there be any, are dealt with in that portion of this document called **Transmission System Engineering**.

CONCLUSION

The applicant predicts an equivalent availability factor of 90 percent or greater, which matches the industry norm of 90 percent for this type of plant. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability.

REFERENCES

LPGC (La Paloma Generating Company, LLC). 1998a. Application for Certification for the La Paloma Generating Project (98-AFC-2). Submitted to the California Energy Commission, August 12.

Mavis, Steve. 1998. Transmission Planner, California Independent System Operator. Telephone conversation with Steve Baker (California Energy Commission), January 23, 1998.

McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. Operational Experience in Competitive Electric Generation, an Executive Report, 1994.

NERC (North American Electric Reliability Council). 1997. 1992-1996 Generating Availability Report.

POWER PLANT EFFICIENCY

Testimony of Steve Baker

INTRODUCTION

PROJECT DESCRIPTION

La Paloma proposes to construct and operate a (nominal) 1,048 MW combined cycle power plant to generate baseload and load-following power (LPGP 1998a, AFC §§ 1.6, 3.9.2.2). The LPGP will consist of four trains, each composed of one ASEA Brown Boveri (ABB) KA-24 172 MW gas turbine, one heat recovery steam generator (HRSG), and one 96 MW steam turbine driving an electric generator (LPGP 1998a, AFC § 3.4.1).

PURPOSE OF THE ANALYSIS

The Energy Commission makes findings as to whether energy use by the LPGP will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the LPGP's consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

SCOPE OF THE ANALYSIS

In order to support the Energy Commission's findings, this analysis will:

- determine whether the facility will likely present any adverse impacts upon energy resources;
- determine whether these adverse impacts are significant; and if so,
- determine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that an environmental analysis be completed prior to determining whether to approve an Application for Certification of a power plant. This analysis must include an identification of the significant effects of a project on the

environment, feasible mitigation measures, and alternatives to the project (Pub. Resources Code, § 21002.1).

CEQA Guidelines state that the environmental analysis "…shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). The Guidelines further require consideration of the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, Appendix F).

LOCAL

No local or county ordinances apply to power plant efficiency.

ANALYSIS

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. The LPGP will burn natural gas at a maximum rate exceeding 52 trillion Btu per year (LPGP 1998a, AFC Fig. 3.4-1). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

La Paloma has described its sources of supply of natural gas for the LPGP (LPGP 1998a, AFC § 4.3.3). Gas will be purchased on the open market. The LPGP will have access to supplies from California, the Southwest, the Rocky Mountains and Canada, transmitted via pipeline systems owned by Kern River and Mojave. These sources represent far more gas than would be required for a project this size. It is therefore highly unlikely that the LPGP could pose a substantial increase in demand for natural gas in California.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

As the natural gas supply system in California is so large and well-established, there is no real likelihood that the LPGP will require development of any new sources of energy.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the LPGP.

PROJECT ENERGY CONSUMPTION

Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment to generate power.

PROJECT CONFIGURATION

The LPGP will be configured as a compound-train combined cycle power plant, in which electricity is generated by four gas turbines, and additionally by four steam turbines that operate on heat energy recuperated from the gas turbines' exhaust. By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The number of turbines further contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back. Rather than being forced to throttle back one large turbine, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one or more gas turbine trains. This allows the plant to generate at less than full load while maintaining optimum efficiency, suitable for a plant meant for load-following duty. Loads down to 25 percent of full load allow one gas turbine/steam turbine train, operating at full load, to maintain peak efficiency.

EQUIPMENT SELECTION

Modern gas turbines, at the leading edge of design and manufacturing progress, embody the most fuel-efficient electric generating technology available today. The "F-class" gas turbines to be employed in the LPGP represent some of the most modern and efficient such machines available at this time. La Paloma will employ a combined cycle power train from a prominent manufacturer, the ASEA Brown Boveri KA-24, nominally rated at 267 MW and 57.3 percent efficiency at ISO[1] conditions (LPGP 1998a, AFC § 3.11.3.2).

[1] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

Electricity will be generated at a peak load efficiency of approximately 55.9 percent (LPGP 1998a, AFC Fig. 3.4-1); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 32 percent.

Efficiency of Alternatives to the Project

The project objectives include generation of baseload electricity principally during peak hours, as market conditions dictate (LPGP 1998a, AFC §§ 1.6, 3.9.2.2, 4.3.1.4).

Alternative Generating Technologies

La Paloma considers alternative generating technologies in its application (LPGP 1998a, AFC § 3.11.3). Oil-burning, coal-burning, solar, wind, hydroelectric, biomass and geothermal technologies are all considered. Given the project objectives, location and air pollution control requirements, staff agrees with La Paloma that only natural gas-burning technologies are feasible.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft jet engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the best available fuel efficiency, but at the same time sells for the lowest per-kilowatt capital cost.

The machine chosen for the LPGP, an “F-class” gas turbine in combined cycle, represents the current state of the art in fuel efficiency. One possible alternative is the Siemens-Westinghouse 501G, a machine recently available on the market. While the 501G promises slightly higher fuel efficiency than the F-class machines, the difference is small (0.7 percentage points). Selecting between the two classes of machine is thus based on other factors, such as generating capacity,[2] cost, ability to meet air pollution limitations, and commercial availability. While the F-class machines have already amassed a service record in numerous power plants around the world, Siemens-Westinghouse is only beginning to deliver 501G machines to

[2] The 501G is available in a single-gas-turbine, single-steam-turbine configuration at 356.6 MW, and a double-single configuration at 712.8 MW, both offering 58.0 percent efficiency (GTW 1998).

customers.[3] Given the marginal efficiency improvements promised by the G-class turbine, La Paloma's decision to purchase an "F-class" machine is a reasonable one.

La Paloma also considers briefly the H-class gas turbine. General Electric will not accept orders for this machine, which promises efficiencies slightly higher than the G-class, until 2001 or 2002 (Bosworth 1999, pers. comm.), too late for consideration by La Paloma.

The expected efficiency of the ABB KA-24 combined cycle, nominally rated at 57.3 percent efficiency, compares favorably to the other two "F-class" machines currently available:

- the General Electric S207FA, nominally rated at 530 MW and 56.5 percent efficiency at ISO conditions; and

- the Siemens-Westinghouse 2x1 501F, rated at 548 MW and 56 percent efficiency (GTW 1998).

Any differences among the three in actual operating efficiency will be insignificant.

With the gas turbine chosen, selection of an appropriate steam turbine for the combined cycle is straightforward. ABB will tailor a machine precisely to the needs of the gas turbine.

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler and the chiller; both devices increase gas turbine power output by cooling the gas turbine inlet air. A chiller can offer greater power output than the evaporative cooler on hot, humid days, while an evaporative cooler promises slightly higher operating efficiency on dry days. Capital and operating costs are higher for the chiller. La Paloma plans to install evaporative cooling; if market conditions prove favorable, the plant may be retrofitted later with chillers (LPGP 1998a, AFC §§ 1.5.2, 3.4.1, 3.9.2.1, 3.11.3.2.4). Staff deems this a reasonable approach to optimum efficiency.

In conclusion, the project configuration (combined cycle) and generating equipment (ABB "F-class" gas turbines) chosen appear to represent the most efficient feasible combination to satisfy the project objectives.

CUMULATIVE IMPACTS

The fuel efficiency of this project cannot affect the fuel efficiency of any nearby projects. Neither can the efficiency of those nearby projects affect the efficiency of

[3] The first 501G machine, at Mitsubishi Heavy Industries' Takasago Works facility in Japan, began operation on April 7, 1997 (GTW 1997). Siemens-Westinghouse recently accepted the first order for a 501G machine from a U.S. customer; the turbine has been sold to the Lakeland, Florida, Department of Electric & Water Utilities (Power 1998). General Electric had planned to offer a G-class machine, but recently decided not to (Bosworth 1998, pers. comm.).

this project. From the standpoint of power plan efficiency, there can be no cumulative impacts.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, will neither influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator and Power Exchange to ensure the efficient management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The LPGP, if constructed and operated as proposed, would generate 1,048 MW of electric power at an overall project fuel efficiency of 55.9 percent. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. In actual operation, the LPGP may actually displace power that would have been generated by other, less efficient plants serving the utility system. The end result could thus be a beneficial, rather than adverse, impact on energy resources. Staff therefore concludes that the LPGP would present no significant adverse impacts upon energy resources.

RECOMMENDATION

From the standpoint of energy efficiency, staff recommends certification of the LPGP.

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TRANSMISSION SYSTEM ENGINEERING

Mark Hesters and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the Energy Commission's decision. This final staff analysis indicates whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission.

The La Paloma Generating Company, L.L.C. (La Paloma) proposes to connect their project, the La Paloma Generating Project (LPGP) to Pacific Gas & Electric Company's (PG&E) transmission system. The California Independent System Operator (Cal-ISO) is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Energy Commission will rely on the Cal-ISO's determinations to make its finding related to applicable reliability standards, the need for additional transmission facilities, and environmental review of the whole of the project. In this case, staff is primarily a facilitator, coordinating the Cal-ISO's process and results with the certification process and the Energy Commission decision. The Cal-ISO will provide testimony at the Energy Commission's hearings (Cal-ISO 1999a, PHC Statement No. 5).

Staff's analysis also evaluates outlet alternatives identified by the applicant and provides proposed conditions of certification to ensure that the project complies with applicable LORS during the design, construction, operation and potential closure of the project.

Public Resources Code, section 25523 requires the Energy Commission to "prepare a written decision…which includes: …findings regarding conformity of the proposed site and related facilities…with public safety standards…and with other relevant local, regional, state, and federal standards, ordinances, and laws." Under the California Environmental Quality Act (CEQA) the Energy Commission must conduct an environmental review of the "whole of the project," which may include facilities not licensed by the Energy Commission (Cal. Code Regs., tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction", formulates uniform requirements for construction of overhead lines. Compliance with this order

ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.

- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 “Criteria for Transmission System Contingency Performance” which requires that the results of power flow and stability simulations verify established performance levels.

Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).

- North American Electric Reliability Council (NERC) Planning Standards provides policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).

- Cal-ISO Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied the assessment of the system reliability implications of the La Paloma Generating Project. Also of major importance to the LPGP, and other privately funded projects which may sell through the California Power Exchange (Cal-PX) are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine if the participant will be paid more or less than, for instance, the generating units dispatched net power output (Cal-ISO 1998a, Cal-ISO 1998b).

- Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

PROJECT DESCRIPTION

The LPGP will be located on a vacant field in an oil well production area about two miles east of the town of McKittrick in Kern County near the intersection of Reserve Road and Skyline Road. The LPGP plant will provide a nominal electrical output of 1,048 MW for sale into the California electricity market. The project will connect to PG&E's network at the Midway substation via a double circuit 230 kilovolt (kV) outlet line.

The switchyard will be located on the project site. The transmission line will be approximately 14.2 miles long and will run parallel to existing structures wherever possible. The line parallels PG&E's Midway-Sunset 230 kV transmission line for about three miles from mile 0.9 to milepost 4. After milepost 4 the line parallels PG&E's #2 500 kV Diablo-Midway line until it reaches the Midway substation. At the Midway substation the line is situated to maintain the necessary clearances around the numerous lines that converge at the substation (LPGP 1998, AFC pages 3.6-1 to 3.6-2).

EXISTING FACILITIES AND RELATED SYSTEMS

The proposed LPGP site is located near a 500 kV transmission line owned by PG&E and a 230 kV owned by the Midway-Sunset Cogeneration Project. Relevant facilities owned by PG&E in the project area include, but are not limited to the following:

- Diablo – Midway 500 kV lines

- Midway – Sunset 230 kV line
- PG&E's Midway substation
- Morro Bay – Midway 230 kV line.

The LPGP will connect to PG&E's system through two vacant 230 kV positions at the Midway substation. The project does not interconnect with existing transmission lines (LPGP 1998, AFC page 3.6-1).

ANALYSIS

INTERCONNECTION FACILITIES

The LPGP's transmission facilities will consist of a 230 kV switchyard and a 230 kV double-circuit overhead transmission line connecting to the Midway substation.

PROJECT SWITCHYARD

The project switchyard configuration will consist of two 230 kV breakers. Two 230 kV transmission circuits will be exiting the switchyard. The circuit breakers will be arranged in a one-on-one arrangement. With this type of an arrangement only a faulted circuit is lost and not the entire plant (LPGP 1998a, AFC page 3.4-11). Staff considers this configuration acceptable.

OUTLET LINE

The LPGP 230 kV transmission line connecting to the Midway substation will be a double circuit line approximately 14.2 miles long and will be designed and constructed to comply with General Order 95. The normal rating of both lines together is large enough to carry the plant's output and, in the event of an outage of one circuit, the emergency rating of each circuit will be able to carry the entire output of the project. The line will consist of a total of twelve wires, two separate 3-phase circuits with each phase consisting of two subconductors. Each conductor will be constructed with 1,590-kcmil ACSR "Falcon." The line will use 118-foot steel poles at an average of 800 feet apart and a maximum 1,000 feet apart for the first 9.5 miles of the line. From miles 9.5 to 13.1 the line will use steel towers 143 feet tall an average of 1,300 feet apart and a maximum of 1,500 feet apart (LPGP 1998a, AFC section 3.6 pages 1-6). At mile 4.0 the line crosses PG&E's Diablo-Midway #2 500 kV line and the Midway-Sunset 230 kV line. These undercrossings and overcrossings will be constructed in accordance with CPUC General Order 95 and PG&E's engineering standards.

MIDWAY SUBSTATION INTERCONNECTION

The LPGP's 230 kV line will terminate at PG&E's Midway substation using two existing, vacant positions on the 230 kV bus (LPGP 1998a, AFC section 3.6 pages 1-6). These positions use a single-breaker, double-bus configuration. The transmission lines entering the Midway substation will be constructed and proper clearances maintained from other transmission lines in accordance with CPUC's GO 95 and PG&E's engineering standards.

The applicant has included an alternate interconnection route and termination point that is discussed in the alternatives section.

SYSTEM RELIABILITY

INTRODUCTION

A system reliability study, called a Preliminary Facilities Study, is performed to determine the affects of connecting a new power plant to the existing electric grid. The study should not only identify impacts but also ways negative impacts can be minimized or negated. Any new transmission facilities, or downstream facilities, required for connection to the grid are considered part of the project and are subject to the full AFC review process. The Cal-ISO has reviewed the Preliminary Facilities Study for the LPGP and has given preliminary approval to the project and does not anticipate the need for any facilities beyond the breakers and bus in the Midway substation and the use of remedial action schemes (Cal-ISO 1999b). The Cal-ISO will give its final approval to the project after reviewing the Detailed Facilities Study, which should be completed by the end of April 1999. The Cal-ISO and staff do not anticipate the need for any mitigation other than the use of remedial action schemes.

The Cal-ISO decided to assign responsibility for congestion on transmission facilities caused by new generators to the new generator. This was called "Advanced Congestion Cost Mitigation" solution to congestion. This solution would require the new generator to mitigate congestion impacts prior to connecting to the Cal-ISO controlled grid. The options for advanced mitigation include upgrading overloaded facilities, the construction of new facilities, remedial action schemes (RAS), a combination of upgrading and RAS, or absorbing congestion costs caused by the new generation. Staff expects the applicant and the ISO to develop remedial action schemes that will mitigate any congestion caused by the La Paloma project. The schemes will be included as conditions of certification for the project. The Cal-ISO will provide testimony on the Preliminary Detailed Facilities Study and will provide preliminary conclusions and findings in the Energy Commission's hearings.

At this time staff does not expect the project will require any downstream facilities. Completion of the Detailed Facilities Study and the subsequent issuance of the Cal-ISO's conclusions and findings regarding the study will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. A condition of certification (TSE-1g) is recommended to provide for Energy Commission review of the Detailed Facilities Study and the PG&E/applicant facility Interconnection Agreement.

SYSTEM RELIABILITY STUDY

A system reliability evaluation determines whether the new project would cause thermal overloads, voltage violations (voltages too high or low), and/or electric system instability (excessive oscillations). In addition to the above analysis, studies are performed to verify that sufficient reactive power (see Definition of Terms) is available. The reliability evaluation must be conducted for all credible "emergency" conditions. Emergency conditions could include the loss of a single or double circuit line, the loss of a transformer or generator, or a combined loss of these facilities. A

Preliminary Facilities Study is conducted in advance of potential system changes, such as the addition of the LPGP into the system, in order to prevent criteria violations. The criteria used in this evaluation include the WSCC Planning Criteria, NERC Planning Standards and applicable Cal-ISO reliability criteria. The reliability implications of the LPGP and the need for additional facilities will be determined by the Cal-ISO based on the Detailed Facilities Study. A preliminary determination of compliance with applicable reliability criteria has been provided by the Cal-ISO (Cal-ISO 1999b).

The LPGP will have a maximum plant delivery of 940 MW. Power delivered from the LPGP to the existing Midway Substation will impact power flows on the existing transmission lines and substations in the Central Valley. A Preliminary Facilities Study that included power flow analysis did not identify any potential transmission capacity deficiencies. A preliminary short circuit study was also performed (Cal-ISO 1999b). A final short circuit and stability study will be provided in the Detailed Facilities Study approximately in May 1999.

By interconnecting at the Midway substation the LPGP would have the most impact on the substation itself and the transmission networks ability to move power from the north to the south during heavy load periods and from the south to north during light load periods. Power flow studies analyzed the affects of LPGP on line flows in several cases:

1) Summer peak-loads with the loss of either of the 230-kV lines connecting LPGP to the Midway substation out.
2) Summer peak-loads with the Los Banos -Midway and the Los Banos-Gates 500 kV lines out.
3) Summer peak-loads with two of the three Midway-Vincent 500 kV lines out.
4) Summer peak-loads with single line outages in PG&E's southern area with 3000 MW flowing on Path 26 (the rating for path 26 is 2400 MW).
5) Winter off-peak loads with single line outages in PG&E's southern area with 3,780 MW flowing on Path 15.
6) Winter off-peak loads with the Los Banos –Midway and the Los Banos –Gates 500 kV lines out.

In all cases electric facilities operated within their rated levels and voltages were within required ranges (LPGP 1998a, Addendum XII). To fully comport with reliability criteria, "extreme contingency" analysis must be conducted but is not presently available. Such analysis is required by reliability criteria not to identify facility upgrades or new facilities but rather to identify necessary mitigation consisting of operational measures. These measures include congestion management and the implementation of RAS. The Cal-ISO does not anticipate the need for facility modification or new facilities as a result of these planned studies other than perhaps new or modified RAS. (Cal-ISO 1999b).

A short circuit study was performed for the LPGP. The LPGP analysis shows that the breakers at the Midway substation operate within acceptable limits and no new breakers will be required. The Cal-ISO will make its final determination based on the Detailed Facilities Study (LPGP 1998a, Addendum XII). Short circuit analyses are conducted to assure that breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The acceptability of breaker ratings can also be determined during the compliance phase; it need not be done during the AFC process. Conditions of certification (TSE-1) have been provided to cover this eventuality.

Based on the Preliminary Facilities Study results and the conclusions and recommendations of the Cal-ISO, staff believes that the LPGP will be interconnected to the existing system in accordance with reliability criteria and that no new or modified downstream facility is required. Conformance verification with reliability criteria and interconnection standards will be assessed in the Commission's Compliance and Monitoring Process (see Conditions of Certification TSE-1, 2 and 3). Staff's proposed conditions of certification require a Detailed Facilities Study and an executed Interconnection Agreement between LPGP and PG&E. As a practical matter staff anticipates that the Detailed Facilities Study and approval by the Cal-ISO will be available near the end of the siting process.

ALTERNATIVES

OUTLET LINE

The applicant does not define specific alternatives but does discuss various ways the 230 kV line could run parallel to or on other sides of existing lines. Other options could include the creation of new right-of-ways, which are not parallel to existing lines, but in the applicant's view that would increase land use impacts.

MILE 0 TO MILE 4.0

LPGP chose to place the 230 kV line from miles 0 to 4.0 on the East Side of the Midway-Sunset 230 kV line because this minimized conflicts with gas and distribution lines on the West Side.

MILE 4.0 13.6 (MIDWAY SUBSTATION)

There were several options for this section of line, which were rejected in favor of the proposed route configuration for various reasons. The LPGP outlet could run parallel to the Midway-Sunset 230 kV line until it reaches the Midway substation, however this was rejected because it requires longer access roads. The LPGP line could also run parallel to the Diablo Midway #3 500 kV line but this was rejected because it increases the length of the LPGP line without any advantages over paralleling the Diablo Midway #2 500 kV line. The applicant also looked at alternative line locations around the Midway substation but did not specify why one was chosen over another (LPGP 1998a, AFC pages 3.11-17 to 3.11-18). All of these options appear to comply with GO 95 clearance requirements.

DELIVERY POINTS

The applicant considered interconnecting to the Morro Bay-Midway 230 kV line. This would require the construction of a 230 kV bus and 4 230 kV line terminations at the project site. The Morro Bay-Midway 230 kV lines would then be looped into the project site through two 1.5 mile 230 kV double circuit lines. However, this option costs much more than the preferred alternative without any offsetting benefits (LPGP 1998a, AFC page 3.11-18). The Cal-ISO has preliminarily approved the project termination at the Midway substation.

CUMULATIVE IMPACTS

There is insufficient data to evaluate cumulative impacts on the transmission system. Two other projects, the Sunrise Cogeneration and Power Project (Sunrise) and the Elk Hills Power Project (Elk Hills), located in the same general area have filed AFCs with the Energy Commission. Staff expects two more projects, the Midway-Sunset Power Project (Midway-Sunset) and the Pastoria Power Project (Pastoria) will file AFCs later this year. Finally, the Morro Bay Power Plant Project (Morro Bay) AFC is expected later this year as well, and while it is not located in the same area it may affect the transmission system in and around the Midway substation. From various conversations and statements made by applicants at workshops, staff understands that the proponents of these projects are discussing consolidating their transmission facilities. The only specific consolidation is a possible Sunrise line that connects into Elk Hills. The power from both the Elk Hills and Sunrise projects would then connect to the Midway substation via a shared two-circuit 230 kV line.

Elk Hills Power, LLC has filed an interconnection study (Elk Hills, March 19, 1999) in the La Paloma case on the cumulative system impacts of the La Paloma, Sunrise and Elk Hills projects. Neither staff nor the Cal-ISO has fully reviewed this study. However, a preliminary analysis shows that after the first project (La Paloma) is terminated, modifications to the Midway substation will be required to accommodate Sunrise. According to the Elk Hills study, the interconnection of either or both of the Sunrise and Elk Hills projects to the Midway substation after the La Paloma project will require:

1. the replacement of eight 230 kV breakers at the Midway substation;
2. rearranging the existing 230 kV bus and transmission towers at the Midway substation;
3. the extension of the existing 230 kV bus at the Midway substation and adding two 230 kV bays (Elk Hills, March 19, 1999).

Both the Sunrise and Elk Hills projects have described interconnection options that loop into the Midway-Wheeler Ridge 230 kV transmission line that is co-owned by PG&E and California Department of Water Resources. If the projects use this option, eight breakers at the Midway substation will need to be replaced and a remedial action scheme will be implemented under specific conditions (Elk Hills, March 19, 1999).

The Midway-Sunset, Pastoria and Morro Bay projects have not filed AFCs with the CEC. Staff does not have any information on the effects of these projects on the transmission grid and cannot analyze potential impacts.

FACILITY CLOSURE

INTRODUCTION

The parallel operation of generating stations is controlled, in part by CPUC Rule 21. This rule and standard utility practices for interconnecting a generating unit provide for the participating transmission owner (PTO) to have control of breakers and disconnect switches where the outlet line terminates (the Midway substation) and general control over the interconnected generators. Prior to construction and interconnection of a generating unit, the PTO reviews and comments on the plans and specifications for the power plant and termination equipment that is important to safe and reliable parallel operation[1] and inspects the interconnection facilities. Contractual provisions may be developed to provide backup or other power service and codify procedures to be followed during parallel operation. Before generating stations are permitted to bid into the Cal-PX and be dispatched by the Cal-ISO, generator standards must be met and the generating station must commit to comply with instructions of the Cal-ISO dispatchers. All participating generators must sign a Participating Generator Agreement (Cal-ISO 1998a, Cal-ISO 1998b). Procedures for planned, unexpected temporary closure and unexpected permanent closure must be developed or verified to facilitate effective communication and coordination between the generating station owner, PTO and the Cal-ISO to ensure safety and system reliability.

CPUC General Order 95, Rule 31.6 requires that “lines or portions of lines permanently abandoned shall be removed by their owners so that such lines shall not become a public nuisance or a hazard to life or property.” Condition of certification TSE-1c requires compliance with this rule.

The ability of the above LORS to reasonably assure safe and reliable conditions in the event of facility closure was evaluated for three scenarios:

PLANNED CLOSURE

This type of closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances the requirement for the owner to provide a closure plan 12 months prior to closure in conjunction with applicable LORS is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure

[1] As an example the PTO has control over the generating unit breakers so that only when the PTO’s line crews have completed maintenance, for instance and are clear of the line or other facilities could the unit reclose into the system.

provides time for the owner to coordinate with the PTO[2] to assure (as one example) that the PTO's system will not be closed into the outlet thus energizing the project switchyard. Alternatively, the owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads[3].

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishment of an on-site contingency plan (see General Conditions Including Compliance Monitoring and Closure Plan).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan that is in place and approved by the CPM prior to the beginning of commercial operation of the facilities will be developed to assure safety and reliability (see General Conditions Including Compliance Monitoring and Closure Plan).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has received the Preliminary Facilities Study and the Cal-ISO has issued preliminary findings regarding the LPGP connection to the Midway substation. The Cal-ISO's preliminary findings indicate that reliability criteria will be met and no downstream facilities will be required for the interconnection of the LPGP to meet NERC, WSCC and Cal-ISO reliability criteria; staff concurs.

RECOMMENDATIONS

Staff proposes the following conditions of certification to insure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to requirements listed below. The substitution of Compliance Project Manager (CPM) approved

[2] The PTO in this instance is PG&E e.g., the system owner to which the project is interconnected.

[3] These are mere examples many more exist.

"equivalent" equipment and equivalent switchyard configurations is acceptable.

a) The project 230 kV switchyard shall include a one-on-one, breaker and bus configuration.

b) Breakers and bus shall be sized to comply with a short circuit analysis.

c) The transmission facilities shall meet or exceed the requirements CPUC General Order 95.

d) An approximately 13.6 mile long double circuit 230 kV overhead line will be constructed in order to interconnect the La Paloma Generating Plant to the Midway Substation. The line will use steel pole construction with 1590 kcmil ACSR cable with two conductors per phase.

e) Termination facilities at the Midway Substation shall comply with applicable Cal-ISO and PG&E interconnection standards (CPUC Rule 21).

f) Outlet line crossings and line parallels shall be coordinated with the transmission line owner and comply with the owner's standards.

g) The applicant shall provide a Detailed Facilities Study and an executed facility Interconnection Agreement for the LPGP transmission interconnection with PG&E. The Detailed Facilities Study and Interconnection Agreement shall be coordinated with the Cal-ISO.

Verification: At least 60 days prior to start of construction of transmission facilities, the project owner shall submit for approval to the CPM, electrical one-line diagrams signed and sealed by a registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements 1a through 1g above. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CPM approval.

TSE-2 The project owner shall inform the CPM of any impending changes, which may not conform to the requirements 1a through 1f of TSE-1, and have not received CPM approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or switchyard configurations shall not begin without prior written approval of the changes by the CPM.

Verification: At least 60 days prior to construction of transmission facilities, the project owner shall inform the CPM of any impending changes which may not conform to requirements of **TSE-1** and request approval to implement such changes.

TSE-3 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction and any subsequent CPM approved changes thereto, to ensure conformance with CPUC GO-95 and CPUC Rule No. 21 and these conditions. In case of non-conformance, the project owner shall inform the CPM in writing within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after synchronization of the project, the project owner shall transmit to the CPM an engineering description(s), and one-line drawings of the “as-built” facilities signed and sealed by a registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95, CPUC Rule No. 21 and these conditions shall be concurrently provided.

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Elk Hills, LLC (Elk Hills), 1999. Elk Hills submittal, March 1999.

DEFINITION OF TERMS

ACSR	Aluminum cable steel reinforced. A composite conductor made up of a steel core surrounded by aluminum wire.
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere	The unit of current flowing in a conductor.
Bundled	Two wires 18 inches apart.
Bus	Conductors that serve as a common connection for two or more circuits.
Conductor	The part of the transmission line (the wire) which carries the current.
Congestion Management	Congestion management is a scheduling protocol, which provides that dispatched generation, and transmission loading (imports) will not violate criteria.
Emergency Overload	See Single Contingency. This is also called an L-1.
Kcmil or kcm	Thousand circular mil. A unit of the conductor's cross sectional area; when divided by 1,273, the area in square inches is obtained.
Kilovolt	kV. A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.
L-1	The outage of a single circuit.
Megavar	One megavolt ampere reactive.
Megavars	Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.
Megavolt ampere	MVA. A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.
Megawatt	MW. A unit of power equivalent to 1,341 horsepower.

Normal Operation/ Normal Overload	When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.
N-1 Condition	See Single Contingency. Also called an L-1.
Outlet	Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.
Power Flow Analysis	A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.
Reactive Power	Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.
Remedial Action Scheme (RAS)	A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.
SF6	Sulfur hexafluoride is an insulating medium.
Single Contingency	Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.
Solid dielectric cable	Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.
Thermal rating	See ampacity.
TSE	Transmission System Engineering.
Undercrossing	A transmission configuration where a transmission line crosses below the conductors of another transmission line – generally at 90 degrees.
Underbuild	A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Testimony of Marc S. Pryor and Eileen Allen

PURPOSE OF THE ALTERNATIVES ANALYSIS

Staff is required to examine the "feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment". The purpose of staff's alternatives analysis is to provide the Energy Commission with an analysis of a reasonable range of feasible alternative sites which could substantially reduce or avoid any potentially significant adverse impacts of the proposed project. (Cal. Code Regs., tit. 14, §15126(d)) (Cal. Code Regs., tit. 20, § 1765) This analysis identifies the potential significant impacts of the proposed project, technology alternatives and alternative sites that are capable of reducing or avoiding significant impacts.

ALTERNATIVE ANALYSIS CRITERIA

The "Guidelines for Implementation of the California Environmental Quality Act" (CEQA), Title 14, California Code of Regulations Section 15126(d), provide direction by requiring an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the project objectives..." In addition, the analysis must address the "no project" alternative (Cal. Code Regs., tit. 14, §15126(d)).

The range of alternatives is governed by the "rule of reason" which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. CEQA states that an environmental document does not have to consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. (Cal. Code Regs., tit. 14, §15125(d)(5)). However, if the range of alternatives is defined too narrowly, the analysis may be inadequate. (*City of Santee v. County of San Diego* (4th Dist. 1989) 214 Cal.App. 3d 1438).

To prepare this alternatives analysis, the staff used the methodology summarized below:

1. Identify the basic objectives of the project.

2. Identify and evaluate alternatives to project. - The principle project alternatives examined that do not require the construction of a natural gas-fired facility are increased energy efficiency (or demand side management) and construction of alternative technologies (e.g., geothermal, wind or solar).

3. Identify and evaluate alternative locations or sites.

4. Evaluate the impacts of not constructing the project (the "no project" alternative).

BASIC OBJECTIVES OF THE PROJECT

After studying the La Paloma Application for Certification (AFC), Energy Commission staff has determined the project's objectives to be:

- The construction and operation of a merchant power plant in the western San Joaquin Valley region that supplies economic, reliable, and environmentally sound electrical energy and capacity in the newly deregulated power market.
- To locate near key infrastructure, such as transmission line interconnections, and supplies of process water and natural gas.

DETERMINING THE SCOPE OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternatives analysis is to provide the Energy Commission with a reasonable range of feasible alternatives which could substantially reduce or avoid any potentially significant adverse impacts of the proposed project. To accomplish this, staff must determine the appropriate scope of analysis. Consequently, it is necessary to identify and determine the potential significant impacts of the proposed project and then focus on alternatives that are capable of reducing or avoiding significant impacts.

This section presents staff's analysis of generation and siting alternatives, and the "no project" alternative (CEQA Guidelines, section 15112(d)(2). In addition, alternative routes for the proposed project's linear facilities are addressed. Alternatives were developed in response to comments and information provided by Energy Commission staff and staffs of other agencies.[1]

In considering location alternatives, the staff had to determine a reasonable geographical area. Since alternatives must consider the underlying objectives of the proposed project, staff confined the geographic area for location alternatives to the west central San Joaquin Valley region. The locations chosen are consistent with the La Paloma project's objectives and the applicant's siting criteria of close proximity to and availability of, suitable transmission line interconnections, process water and natural gas supplies.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

Technical areas that identified potential significant environmental impacts were air quality, water resources, biological resources and visual resources. However, it is staff's opinion that the mitigation measures La Paloma has proposed well reduce any potential significant environmental impacts to less than significant levels.

[1] Other sections of this PSA (e.g., Air Quality) provide discussions of additional mitigation alternatives of a specific technical nature that are not considered in this section.

ALTERNATIVES TO THE PROJECT

GENERATION TECHNOLOGY ALTERNATIVES

Public Resources Code section 25305(c) limits the scope of alternatives analysis during a siting case under specific conditions. This section states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission's Electricity Report and shall not be considered as alternatives to a proposed facility during the siting process. Thus, such alternatives are not included in this PSA.

We did compare various alternative technologies with the proposed project, scaled to meet the project's objectives. We examined the principal electricity generation technologies which do not burn fossil fuels such as natural gas. The technologies which could serve as alternatives to the proposed project are geothermal, solar, hydroelectricity, and wind. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions.

However, there are no geothermal resources in the western San Joaquin Valley region. Solar, wind, and hydroelectricity resources require large land areas in order to generate 1,048 megawatts of electricity. Specifically, centralized solar projects using the parabolic trough technology require approximately 5 acres per megawatt; 1,048 megawatts would require approximately 5,240 acres, more than 200 times the amount of space taken by the proposed plant site and linear facilities. Photovoltaic arrays require similar acreage per megawatt. Centralized wind generation areas generally require 40-50 acres per megawatt, with 1,048 megawatts requiring 42,000-52,000 acres, more than 1,700 to 2,100 times the amount of space taken by the proposed plant site and linear facilities. Large hydroelectric facilities generating 1,048 megawatts would inundate nearly 70,000 acres with water.

The alternative technologies discussed above have the potential for significant land use, biological and visual impacts. This is true in the western San Joaquin Valley which has a number of irrigated agricultural areas, sensitive species and related habitat areas, and many broad views of the Coast Range from Interstate 5. Looking outside the San Joaquin Valley, the development uncertainties and the potential for impacts at remote resource areas are significant constraints. Consequently, staff does not believe that geothermal, solar, wind, and hydroelectric technologies present any feasible alternatives to the proposed project.

LINEAR FACILITY ROUTING ALTERNATIVES

RAW WATER SUPPLY PIPELINE

In the AFC, La Paloma presents two alternative routes for both the raw water pipeline and the transmission line (LPGP 1998a, p. 3.11-14 and Map 3.2-1). Both alternatives share a common route between the plant site and the Midway-Sunset's 230 kV transmission line corridor, approximately 2 miles west of the plant site. La

Paloma's preferred routing (designated herein as WS-1) then turns north and parallels the south side of State Route 58 right of way to the California Aqueduct. The second route (designated herein as WS-2) parallels the Midway-Sunset transmission line to the aqueduct.

Staff agrees with La Paloma's position that WS-1 is superior to WS-2 because it reduces, by virtue of lying within the right of way of SR 58, impacts on biological resources that would occur if WS-2 was selected.

TRANSMISSION LINE

The closest electrical substation to the proposed site is PG&E's Midway Substation at Buttonwillow, about 14 miles northeast of the proposed plant site. Routing the transmission line to any other existing substation would be less desirable due to the increased levels of impacts on sensitive biological species and related habitat.

ALTERNATIVE TL-1

This is La Paloma's preferred transmission route. It proceeds west from the plant site until it reaches the Midway-Sunset 230 kV transmission line. It then turns north and parallels the Midway-Sunset transmission line to a point four route miles from the plant site. At this point, the transmission line would parallel the north side of the Diablo-Midway #2 500 kV transmission line to the substation. The total routing distance is about 13.6 miles.

ALTERNATIVE TL-2

This second route is about 16 miles long and parallels the Midway-Sunset transmission line all the way to the Midway substation. The additional length of this line in, comparison to TL-1, occurs in the irrigated agricultural area just south of Buttonwillow.

Both routes TL-1 and TL-2 traverse areas with similar characteristics, but because of its shorter route distance, TL-1 would have fewer impacts on biological resources and agricultural activities. Therefore, staff agrees with La Paloma and prefers the TL-1 transmission line alternative.

NATURAL GAS AND POTABLE WATER SUPPLY PIPELINES

NATURAL GAS SUPPLY PIPELINE

The 370-foot pipeline route crosses an area with minimal environmental resources, and it is the most expeditious route. Therefore, staff concluded that it need not examine route alternatives.

POTABLE WATER SUPPLY PIPELINE

The proposed potable water pipeline would follow the right-of-ways of Reserve and Skyline Roads and tap into the closest feasible water main which is about 2 miles away in McKittrick. By following the right-of-ways, the potable water pipeline would avoid any environmental impacts associated with going directly cross-country. Additionally, very little distance would be gained by going directly cross-country

because the road routes provide almost a straight path to McKittrick. Staff believes the proposed potable water supply pipeline route selected by La Paloma is the best route.

ALTERNATIVE SITES

SELECTION OF POTENTIAL ALTERNATIVE SITES

As noted above, the three technical areas that identified potential significant environmental impacts were air quality, water resources, and biological resources. Because the San Joaquin Valley Unified Air Pollution Control District covers all of the alternative sites and contains many possible and feasible sources of air emissions credits, staff believes that each alternative site would have a sufficient amount of credits available. Therefore, the availability of emission credits for the alternative sites is not a criterion that would distinguish one alternative site from another.

Staff believes the most feasible alternative to using California Aqueduct water for cooling purposes is dry cooling. This option is available at all nine sites and, therefore cannot be used to distinguish one site from another.

Minimizing the lengths of one or more linear facilities presents fewer and/or less severe impacts on biological resources. In addition, because La Paloma does not have the right of eminent domain, acquisition of access rights for linear facilities may be more fasible for shorter routes. Therefore, potential sites that offered the possibilities of reducing the lengths of one or more linear facilities were selected, using the following criteria:

- A location in a sparsely populated region.
- A location with the California Aqueduct less than 8 miles away, and the potential for using process water from oilfield activities.
- Access to the site via existing roads.
- Proximity to existing electric transmission and natural gas corridors.
- Having either an existing substation of sufficient capacity within 25 miles or, if no substation within 25 miles, then a site that is immediately adjacent to a 230 kV transmission line and has sufficient room for a co-located switchyard.
- Parcel size of at least 23 acres.
- A site eligible for a county conditional use permit for an industrial development, and compatible zoning and County General Plan designations.

ANALYSIS OF INDIVIDUAL SITES

Eight potential alternative sites, in addition to the proposed site, were selected that met the above criteria (see ALTERNATIVES Figure 1). Numbers have been assigned to each site for identification purposes only; no other significance is attached. (The LPGP proposed site has been included in the analysis as Site 1 to enable easier comparisons.) The sites are:

1. LPGP
2. Elk Hills Road
3. Cymric[3]
4. Belridge[2]
5. Kettleman City - East
6. Kettleman City - West
7. Gates
8. Panoche Road
9. Santa Nella

The following steps were performed next:

1. The identification of potential sites using maps showing substations, transmission lines, the California Aqueduct and natural gas pipelines.

2. Preliminary site visits were conducted. (These visits eliminated other potential sites, such as the former Crows Landing Naval Air Facility near Patterson, due to obvious problems. In this particular case, the site is occupied by the National Aeronautics and Space Administration and is unavailable.)

3. A parcel of land was found at each potential area that provides A) at least 23 acres of land, and B) roadways for use as access and as corridors for linear facilities.

4. Staff members of the appropriate counties were asked about any potential problems and/or issues associated with the site(s) within their jurisdiction and local area of the site.

5. Descriptions of each site were compiled and additional site visits were conducted.

6. Potential advantages and disadvantages of each site were listed. Both "potential show-stoppers" and "potential significant environmental impacts" were identified.

[2] The applicant evaluated the Belridge alternative site.
[3] The applicant evaluated the Cymric alternative site.

ALTERNATIVES Figure 1
Alternative Site Locations

(THIS FIGURE IS NOT AVAILABLE ELECTRONICALLY)

7. Each site was evaluated for potential significant environmental impacts before mitigation, possible mitigation measures and significance levels after mitigation (if possible). Sites that presented any impacts that could not be mitigated to less than significant levels were eliminated from further consideration.

SETTING

WESTERN SAN JOAQUIN VALLEY REGION

Foothills of the Coast Mountains bound the western San Joaquin Valley region on the west. The Interstate 5 (I-5) freeway corridor, large electrical transmission lines, and two large aqueduct systems, the State Water Project (SWP), otherwise known as the California Aqueduct, and the federal Central Valley Project (CVP), each thread their way south from the Sacramento Delta region.

Agriculture is the primary land use of the region with cotton fields, orchards and vineyards dominating. Cattle grazing and diary production activities occur but are more limited. Clusters of commercial activities occur at the intersections of I-5 and state highways and provide services for travelers. Some of these clusters are not located adjacent to existing residential communities, while others are in close proximity to residential communities. Examples of the latter are Kettleman City and Santa Nella.

In the southern San Joaquin Valley, agriculture is still the predominant land use. However, oil production is a large factor, especially in the western fringe of Kern County in the Taft, McKittrick, Cymric and Belridge areas. In addition, natural areas, such as the Lokern Natural Area and the Buena Vista Valley Management Area, are important uses of land in the region.

ALTERNATIVE SITES

A feature common to each alternative site is that an industrial use such as an electric power plant would be allowed by each county, through a conditional use permit. Alternative sites 1 through 4 are located in Kern County; alternative sites 5 and 6 are located in Kings County; alternative sites 7 and 8 are located in Fresno County; and alternative site 9 is located in Merced County. ALTERNATIVES Appendix A contains a detailed description of each alternative site.

ALTERNATIVES Table 1 summarizes the distances of each linear facility, by alternative site, and presents the total distances associated with each alternative.

ALTERNATIVES Table 1
Linear Facility Routes Distances

LINEAR FACILITIES	T-Line	Natural Gas	Raw Water	Potable Water	Total
SITES					
1 – LPGP proposed	13.6 mi	370 ft	8 mi	2 mi	24 mi
2 – Elk Hills Rd.	10 mi	1.5 mi	0.5 mi	10 mi	22 mi
3 – Cymric	17 mi	5 mi	8 mi	OSW	30 mi
4 – Belridge	22 mi	8 mi	5 mi	OSW	35 mi
5 – Kettleman City, E.	1, 000 ft	500 ft	1 mi	1mi	2+ mi
6 – Kettleman City, W.	5 mi	1 mi	4 mi	2 mi	12 mi
7 – Gates	2 mi	2 mi	3 mi	OSW	7 mi
8 – Panoche Rd.	1 mi	1 mi	5 mi	OSW	7 mi
9 – Santa Nella	4 mi	500 ft	500 ft	2.5 mi	7 mi

OSW = On site well water supply

SITE 1, LPGP PROPOSED SITE – KERN COUNTY

SITE DESCRIPTION

- The proposed site is an unused, former oil field which is not expected to be returned to production and lies within the northern section of the Elk Hills oil production area.

- The small, unincorporated communities of McKittrick and Buttonwillow, are located approximately two miles west, and 13 miles east, respectively.

- Cooling water would be supplied from the California Aqueduct.

ADVANTAGES

- No known potential “show-stoppers” or significant environmental impacts.
- Land for the power plant has been purchased, and permanent easements for the transmission line, raw water pipeline and water reservoir tank have been obtained.
- California Aqueduct water would be supplied by the West Kern Water District and would not constitute a “new” use.
- Western Kern County has many air quality offsets available.
- Transmission line access has been obtained.
- The natural gas supply interconnection is only 370 feet long.
- Geologic and flood plain conditions are suitable.
- Wastewater can be disposed of by deep well injection, but a zero discharge system is an option.

DISADVANTAGES

- Length of the cooling water supply pipeline (from the California Aqueduct) would be about 8 miles, which is equal to Site 3, Cymric and longer than the remaining

alternative's cooling water pipelines. Therefore, the biological resource impacts resulting from this line would be more numerous than for shorter linear alternatives.
- Length of the interconnection transmission line would be about 13.6 miles, the second longest of the alternatives.

SITE 2, ELK HILLS ROAD – KERN COUNTY

SITE DESCRIPTION

- This alternative site is located on an alluvial fan plain about 10 miles south of Buttonwillow.
- The current land use is grazing for cattle and/or sheep.
- Cooling water would be supplied from the California Aqueduct, which is adjacent to the site's northern boundary.

ADVANTAGES

- The adjacent California Aqueduct water is available and would be supplied by the water district as at the proposed site (West Kern WD), which would not constitute a "new" use.
- The nearest community, Buttonwillow, is 10 miles to the north, as compared to the community of McKittrick, which is about 2 miles from the proposed project site.
- Geologic and flood plain conditions are suitable.
- Western Kern County has many air quality offsets available.
- The site is not located in an oil production area.
- The land is not being cultivated.

DISADVANTAGES

- Potential "Show-stopper" - The site does not appear to be available for purchase.
- Potential "Significant Environmental Impact" - Visual resources impacts could be significant because there are no other similar uses near, and the site is on an alluvial plain of the Elk Hills range which would make the plant moderately to highly visible.
- Waste water discharge may be a problem, unless a zero discharge system or dry cooling is used.

SITE 3, CYMRIC – KERN COUNTY

SITE DESCRIPTION

- This alternative site is located about 15 miles west of Buttonwillow and about two miles west of Highway 33.
- It is an unused part of an existing oilfield.
- There are several cooling water options, which are discussed below under Advantages.

ADVANTAGES

- California Aqueduct water could be supplied, from about 8 miles away, by the same water district as at the proposed site (West Kern WD), which would not constitute a "new" use. This alternative site offers two cooling options in addition to the aqueduct water, on-site wells, or dry cooling.
- The nearest communities, McKittrick and Buttonwillow, are about 5 miles to the south and 15 miles to the east, respectively, as compared to McKittrick being about 2 miles from the proposed project site.
- Geologic and flood plain conditions are suitable.
- Existing industrial-type uses (oil production) reduce visual resource impacts that would otherwise exist at this site.
- Western Kern County has many air quality offsets available.
- The land is not being cultivated.

DISADVANTAGES

- Potential "Show-stopper" - The site does not appear to be available for purchase.
- The natural gas supply pipeline would be about 5 miles long, affecting many sensitive biological resources in the area.
- The location is an existing oilfield area that may expand;
- Wastewater discharge may be a problem, unless a zero discharge system or dry cooling is used.

SITE 4, BELRIDGE – KERN COUNTY

SITE DESCRIPTION

- This alternative site is located about 18 miles northwest of Buttonwillow, at the intersection of Highway 33 and Lerdo Road.
- It is an unused part of an existing oilfield.
- Cooling water could be supplied by on-site wells, or from the California Aqueduct.

ADVANTAGES

- The nearest communities are McKittrick and Buttonwillow, which are about 10 miles south and 15 miles east, respectively (compared to the community of McKittrick which is about 2 miles from the proposed project site).
- Geologic and flood plain conditions are suitable.
- Existing industrial-type uses (oil production) reduce visual resource impacts that would otherwise exist at this site.
- Western Kern County has many air quality offsets available.
- The land is not being cultivated.

DISADVANTAGES

- Potential "Show-stopper" - The site does not appear to be available for purchase.
- Potential "Significant Environmental Impacts" - Use of California Aqueduct water at this site would be constitute a "new use". The project would encounter 1) biological problems associated with the Delta region (such as impacts on the Delta Smelt), and 2) opposition from local water agencies that provide agricultural, not "municipal", water. Dry cooling is a possible alternative.
- The natural gas supply pipeline would be about 8 miles long;
- Length of the interconnection transmission line would be about 22 miles (about 47% longer than the proposed project's);
- The location is an existing oilfield area that may expand.

SITE 5, KETTLEMAN CITY – EAST - KINGS COUNTY

SITE DESCRIPTION

- The community of Kettleman City is approximately one mile east of this alternative site.
- The site is zoned for industrial use, although it is currently vacant and overgrown with weeds.
- Cooling water would be supplied from the California Aqueduct.

ADVANTAGES

- The site is adjacent to two existing 230 kV transmission lines and to a large natural gas supply line.
- Length of the cooling water supply pipeline (from the California Aqueduct) would be about 1 mile (1/8th of the proposed project's).
- Air quality offsets are available.
- No oilfields would be affected.
- Geologic and flood plain conditions are suitable.
- Biological impacts associated with the shorter transmission line and raw water supply pipeline lengths would be less than the proposed project's (see below disadvantages, however).
- Land is not cultivated.

DISADVANTAGES

- Potential "Show-stopper" - The site does not appear to be available for purchase.
- Potential "Significant Environmental Impacts" - Because use of California Aqueduct water would be constitute a "new use", the project would encounter 1) biological problems associated with the Delta region (such as impacts on the Delta Smelt), and 2) opposition from local water agencies that provide agricultural, not "municipal", water. Dry cooling would be a possible alternative.
- Potential "Significant Environmental Impacts" - Close proximity to both Kettleman City itself (about 0.5 miles north) and the commercial area at I-5 and Hwy 41 (about 1 mile south) may create potential significant socioeconomic (environmental justice)[4] and visual resources impacts. Both the County of Kings General Plan and Zoning Code would need to be revised to allow a non-utility owned power plant at the location.
- Wastewater discharge may be a problem, unless a zero discharge system is used.

SITE 6, KETTLEMAN CITY – WEST – KINGS COUNTY

SITE DESCRIPTION

- This alternative site is located approximately one mile west of Kettleman City.
- Cooling water would be supplied from the California Aqueduct.
- The current land use is grazing.

ADVANTAGES

- Length of the interconnection transmission line would be about 5 miles (about1/2th of the proposed project's);
- Length of the cooling water supply pipeline (from the California Aqueduct) would be about 4 miles (half the distance of the proposed project's);
- Air quality offsets are available, but may require distance factoring;
- No oilfields would be affected;
- Geologic and flood plain conditions are suitable;
- Biological impacts associated with the shorter transmission line and raw water supply pipeline lengths would be less than the proposed project's (see below disadvantages, however).

DISADVANTAGES

- Potential "Show-stopper" - The site does not appear to be available for purchase.
- Potential "Show-stopper" - Close proximity to the Kettleman City commercial area at I-5 and Hwy 41 (about1 mile north) and adjacency to Hwy 41 creates significant socioeconomic/environmental justice and visual resources concerns.

[4] Kettleman City's predominantly Hispanic population (I.e., approximately 95%) has expressed concern about the community being targeted for the siting of heavy industrial uses, such as an existing hazardous waste disposal facility. Potential siting of a large electric power plant near Kettleman City could add to community concerns.

- Potential “Significant Environmental Impacts” - Because use of California Aqueduct water would be constitute a “new use”, the project would encounter 1) biological problems associated with the Delta region (such as impacts on the Delta Smelt), and 2) opposition from local water agencies that provide agricultural, not “municipal”, water. Dry cooling would be a possible alternative.
- The natural gas supply pipeline length would be about 2 miles.
- Both the County of Kings General Plan and Zoning Code would need to be revised to allow a non-utility owned power plant at the location.
- Waste water discharge may be a problem, unless a zero discharge system is used.
- The transmission line would have to cross Interstate 5 and Highway 41.

SITE 7, GATES – FRESNO COUNTY

SITE DESCRIPTION

- This alternative site is located about six miles south of the community of Huron, and about 15 miles east of the community of Coalinga.
- The primary land use is cultivation of cotton, with some vineyards and orchards nearby.
- Cooling water would be supplied from the California Aqueduct.

ADVANTAGES

- Length of the interconnection transmission line would be about 2 miles (1/5th of the proposed project’s).
- Length of the cooling water supply pipeline (from the California Aqueduct) would be about 1 mile (1/8th of the proposed project’s).
- Air quality offsets are available.
- No oilfields would be affected.
- The nearest community, Huron, is about 6 miles to the north, compared to the community of McKittrick which is about 2 miles from the proposed site.
- Geologic and flood plain conditions are suitable.
- The land has been disturbed by extensive agricultural activities for many years.
- Biological impacts associated with the shorter transmission line and raw water supply pipeline lengths would be less than the proposed project’s (see below disadvantages, however).

DISADVANTAGES

- Potential “Show-stopper” - The site does not appear to be available for purchase.
- Potential “Show-stopper” - Cotton is cultivated on all suitable parcels (all parcels are zoned for agricultural uses without a provision for merchant power plant use). Current cultivation of crops is an indicator that the changes in the General Plan and Zoning Code are not likely.
- Potential “Significant Environmental Impacts” - Because use of California Aqueduct water would be constitute a “new use”, the project would encounter 1) biological problems associated with the Delta region (such as impacts on the

Delta Smelt), and 2) opposition from local water agencies that provide agricultural, not "municipal", water. Dry cooling would be a cooling alternative.
- Both the County of Fresno General Plan and Zoning Code would need to be revised to allow a non-utility owned power plant at the location.
- Wastewater discharge may be a problem, unless a zero discharge system or dry cooling is used.
- Natural gas supply pipeline length would be about 2 miles.

SITE 8, PANOCHE ROAD – FRESNO COUNTY

SITE DESCRIPTION

- This alternative site is located about about eight miles northeast of the communitiy of Mendota, and about 35 miles west of the city of Fresno.
- The site is near PG&E's existing Panoche transmission substation.
- The site's primary land use is cotton cultivation.

ADVANTAGES

- Length of the interconnection transmission line would be about 1 mile (less than 1/14th of the proposed project's).
- Length of the cooling water supply pipeline (from the California Aqueduct) would be about 1 mile (1/8th of the proposed project's).
- Air quality offsets are available.
- No oilfields would be affected.
- The nearest community, Mendota, is about 8 miles to the northeast, compared to the community of McKittrick, which is about 2 miles from proposed site.
- Geologic and flood plain conditions are suitable.
- The land has been disturbed by extensive agricultural activities for many years.
- Biological impacts associated with the shorter transmission line and raw water supply pipeline lengths may be fewer than the proposed project's because of the existing extensive agricultural disturbances (see below disadvantages, however).

DISADVANTAGES

- Potential "Show-stopper" - Land does not appear to be available for purchase.
- Potential "Show-stopper" - Cotton is cultivated on all suitable parcels (all parcels are zoned for agricultural uses without a provision for merchant power plant use). Current cultivation of crops is an indicator that the changes in the General Plan and Zoning Code are not likely.
- Potential "Significant Environmental Impacts" - Because use of California Aqueduct water would be constitute a "new use", the project would encounter 1) biological problems associated with the Delta region (such as impacts on the Delta Smelt), and 2) opposition from local water agencies that provide agricultural, not "municipal", water. Dry cooling would be a possible alternative.
- Waste water discharge may be a problem, unless a zero discharge system or dry cooling is used.
- Natural gas supply pipeline length would be about 1 mile.

- Both the County of Fresno General Plan and Zoning Code would need to be revised to allow a non-utility owned power plant at the location.

SITE 9, SANTA NELLA – MERCED COUNTY

SITE DESCRIPTION

- This alternative site is located about one mile north of an rural residence, and about 2.5 miles south of a residential section of the community of Santa Nella.
- The site's land use appears to be hay production.
- Cooling water would be supplied from the California Aqueduct.

ADVANTAGES

- Length of the interconnection transmission line would be, dependent upon plant location, as much as 4 miles (about 1/3rd of the proposed project's).
- Length of the cooling water supply pipeline (from the California Aqueduct) would be at most about 1 mile (1/8th of the proposed project's).
- Air quality offsets are available.
- No oilfields would be affected.
- Geologic and flood plain conditions are suitable.
- Land is available for purchase.

DISADVANTAGES

- Potential "Significant Environmental Impacts" - Close proximity to both Santa Nella (about 2 miles south) and the I-5/Hwy 152/Hwy 33 interchanges (about 2 miles away) may create significant socioeconomic/environmental justice and air quality concerns.
- Potential "Significant Environmental Impacts" - Because use of California Aqueduct water would constitute a "new use", the project would encounter 1) biological problems associated with the Delta region (such as impacts on the Delta Smelt), and 2) opposition from local water agencies that provide agricultural, not "municipal", water. Dry cooling would be a possible alternative.
- Both the Merced County's General Plan and Zoning Code would need to be revised to allow a non utility-owned power plant at the location.
- Transmission line would have to cross Highway 152.
- Wastewater discharge may be a problem, unless a zero discharge system or dry cooling is used.

COMPARISONS OF ALTERNATIVE SITES

STEP ONE

To compare alternative sites, staff first studied the possible environmental consequences and possible mitigation measures pertaining to each site.

ALTERNATIVES Table 2 displays for each alternative site, technical areas that hold the potential for significant environmental impacts, whether mitigation measures

would be recommended and, if so, whether the measures would reduce the levels of significance to less than significant.

Sites 2, 5, 6 and 9 (Elk Hills Road, Kettleman City East and West, and Santa Nella, respectively) were determined as having environmental impacts upon visual resources that could not be mitigated to less than significant levels, despite mitigation measures being applied. In addition, sites 5, 6 and 9 could not mitigate for socioeconomic impacts due to environmental justice concerns. These sites were eliminated from further consideration.

STEP TWO

Sites 3, 4, 7 and 8 (Cymric, Belridge, Gates and Panoche Road, respectively) were then examined by reviewing the advantages and disadvantages listed above.

CYMRIC

Using California Aqueduct water would be under the same procurement strategy as for the McKittrick site and would not constitute a “new use”. In addition, the raw water pipeline lengths, at eight miles each, are the same for the two sites. Both the transmission line and natural gas supply pipelines would be longer, 17 vs. about 14 miles for the former; 5 miles vs. 370 feet for the latter. However, use of on site wells at Cymric would eliminate the need for a potable water pipeline.

The total length of linear facilities associated with the Cymric site, if aqueduct water is used, is 30 miles. This is six miles longer than that associated with the McKittrick site. If dry cooling is used, than the overall amount of habitat disturbed by linear facilities would be two miles less than that associated with McKittrick. It should be noted that the process water option may be highly speculative because of acquisition and other issues.

ALTERNATIVES Table 2
Summary of Environmental Consequences and Mitigation Measures

IMPACT	Level of Significance Before Mitigation									Mitigation Recommended?									Level of Significance After Mitigation								
Alternative Site	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
Technical Areas																											
Air Quality	S	S	S	S	S	S	S	S	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	L	L	L	L	L	L	L	L	L
Public Health	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hazmat	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indus. Safety/Fire	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-line Safety	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land Use	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Traffic/Trans.	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Noise	L	L	L	L	S	L	L	L	L	-	-	-	-	Y	-	-	-	-	-	-	-	-	L	-	-	-	-
Visual	L	S	L	L	S	S	L	L	L	-	Y	-	-	Y	Y	-	-	Y	-	NMLS	-	-	NMLS	NMLS	-	-	NMLS
Cultural	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Socioeconomics	L	L	L	L	S	S	L	L	L	-	-	-	-	N	N	-	-	-	-	-	-	-	NMLS	NMLS	-	-	NMLS
Waste Mgmt.	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biology	S	S	S	S	S	S	S	S	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	L	L	L	L	L	L	L	L	L
Water	L	L	L	S	S	S	S	S	S	-	-	-	Y	Y	Y	Y	Y	Y	-	-	-	L	L	L	L	L	L
Soils	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paleontology	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Facility Design	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reliability	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Efficiency	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-line Engr.	L	L	L	L	L	L	L	L	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

S = Significant L = Less than significant Y = Yes N = No Hypen (-) = Not applicable NMLS = Not mitigable to less than significant

Alternative sites:
1 = McKittrick
2 = Elk Hills Road
3 = Cymric
4 = South Belridge
5 = Kettleman City – East
6 = Kettleman City - West
7 = Gates
8 = Panoche Road
9 = Santa Nella

Wastewater discharge may present a problem, but may be mitigated by using a zero discharge system. Yet, the Cymric site may conflict with potential oil field expansion, thus reducing or eliminating the potential for site acquisition.

BELRIDGE

Use of California Aqueduct water at the Belridge site would constitute a “new use”, but the dry cooling option is possible here as well. If aqueduct water were used, only five miles of biological habitat would be disturbed by a raw water supply pipeline. As at the Cymric site, use of on site wells would eliminate the need for a potable water pipeline.

The transmission line would cross similar habitats as the proposed McKittrick to Buttonwillow line, but it would be about eight miles longer. The natural gas supply pipeline would be about eight miles long, as compared to 370 feet. Overall, the Belridge site under an aqueduct water scenario would disturb about 35 miles of biological resources, eleven more than McKittrick.

As at Cymric, wastewater discharge may present a problem (but may be mitigated by using a zero discharge system) and the site may conflict with potential oil field expansion, thus reducing or eliminating the potential for site acquisition.

GATES AND PANOCHE ROAD

These sites are located in agricultural areas that depend upon California Aqueduct water for irrigation. Therefore, cooling water for a power plant at these sites would constitute a new use of aqueduct water. A possible mitigation measure that would eliminate the need for aqueduct water is dry cooling.

The total lengths of linear facilities at both these site would be seven miles, far less than for McKittrick. However, since potable water would be supplied by wells, there may be conflicts with other users. (The extent of potential conflicts is unknown.) Waste discharge may present a problem, but zero discharge could be used.

Acquisition of these sites may be impossible and, because of the high intensities of agricultural activities at these sites and in their surroundings, staff believes the necessary general plan amendments and rezones would face stiff opposition by surrounding property owners. Therefore, staff recommends that these sites, under existing conditions, not be considered any further.

THE "NO PROJECT" ALTERNATIVE

CEQA Guidelines and Energy Commission regulations require consideration of the "no project" alternative. This alternative assumes that the project is not constructed, and is compared to the proposed project. A determination is made whether the "no project" alternative is superior, equivalent, or inferior to the proposed project.

In the AFC, La Paloma presented the "no project" alternative as not feasible and provided four supporting arguments for their conclusion (LPGP 1998, AFC page 3.11-22):

1. the "no project" alternative does not meet La Paloma's business plans and the purpose of a merchant power plant;

2. the proposed project would help to "fill the gap between required (electrical) generation and the existing assets";

3. the proposed project "will be environmentally superior to older, existing units, which it will tend to replace or cause to run at lower capacity factors"; and

4. the "no project" alternative does not "fit within the state's plans for deregulating the electric industry, improving the state's environment, and bringing lower rates to California citizens.

The first argument addresses the desirability, and not the feasibility, of the "no project" alternative. Following this argument, any project proponent could dismiss a "no project" alternative simply because it does not satisfy the proponent's goals and objectives.

The “no project” alternative would eliminate the expected economic benefits which the proposed project would bring to Kern County. These include minimum property tax revenues of approximately $5 million per year over the first ten years of operation (LPGP 1998a, p. 5.10-11). Sales tax revenues accrued by the County during construction (from sales on materials) is estimated to be $170,000; corresponding tax revenues accrued by the State are estimated to be $1,062,500. County and State tax revenues accrued through sale taxes during operation of the LPGP are estimated to be at least $610,000 and $381,000 (LPGP 1998a, p. 5.10-19). Payrolls for the construction (22 to 24 months) and operation phases are estimated to be $146 million and $6 million, respectively.

Staff has determined that the “no project” alternative is environmentally superior to the proposed project in an unmitigated condition. This is because the LPGP would, in an unmitigated condition, have significant environmental impacts on air quality, water and biological resources. Not constructing and operating an (unmitigated) power plant would avoid these impacts. However, as stated above, staff believes mitigation measures proposed by La Paloma will reduce any impacts to less than significant levels. In addition, staff recognizes potential environmental and economic benefits derived from the project. Therefore, staff believes that, overall, the “no project” alternative is not superior to the proposed project.

CONCLUSIONS AND RECOMMENDATION

Staff does not believe that energy efficiency measures and alternative technologies (geothermal, solar, wind, and hydroelectric) present any feasible alternatives to the proposed project. Furthermore, staff believes the proposed linear facilities are more feasible than the alternatives considered.

Other than the proposed La Paloma site, the single remaining alternative site that staff would consider potentially feasible, with mitigation measures, is the Cymric site. Mitigation measures identified at this time would include, dry cooling, zero discharge, and all other mitigation measures identified for the proposed site to lessen air quality and biological resources impacts. Other unforeseen mitigation measures may be identified and required if this site is pursued either by La Paloma or any other entity. Without the dry cooling and zero discharge mitigation measures, staff believes that this site is not feasible.

Therefore, staff recommends that the Energy Commission find the proposed La Paloma site and linear facilities to be the preferred choice.

REFERENCES

La Paloma Generating Company, L.L.C. 1998. Application For Certification for the La Paloma Generating Project.

Pryor, M. 1998. Field reconnaissance of alternative sites in Kern, Fresno, Kings, and Merced Counties. December 1, 2 and 22.

ALTERNATIVES Appendix A

DESCRIPTIONS OF ALTERNATIVE SITES

SITE 1: MCKITTRICK (LA PALOMA'S PREFERRED ALTERNATIVE AND PROPOSED SITE) – KERN COUNTY

This alternative power plant site is a former oil field within the northern section of the Elk Hills oil production area. Approximately two miles west is the small-unincorporated community of McKittrick and about 13 miles to the east is the unincorporated community of Buttonwillow. The proposed transmission line route traverses hilly terrain for about five miles north then east from the proposed plant site. For the remainder of the route the proposed transmission line crosses relatively flat terrain with fields of cotton.

The proposed raw water supply route traverses the same types of terrain as the proposed transmission line and, for a portion of the route, closely parallels the transmission line. After four miles the raw water pipeline diverges from the transmission line, proceeds about one-third of a mile until it intercepts Highway 58. The south side of the highway is then followed until it meets the California Aqueduct. Because this site would use West Kern Water District's "banked" aqueduct water, it would not constitute a "new use" of California Aqueduct water. (A "new use" would face many difficult, if not impassable, obstructions to being permitted, including, but not limited to biological impacts and agricultural impacts.) La Paloma proposes to dispose of waste cooling water by using deep well injection at the plant site.

Natural gas would be supplied by a short 370-foot long supply line. A two-mile long pipeline would provide potable water to McKittrick. Both of these lines would utilize road right-of-ways.

SITE 2: ELK HILLS ROAD - KERN COUNTY

This site is located on an alluvial fan plain about 2 miles west of the Elk Hills Road and 10 miles south of Buttonwillow. It appears to be used as grazing land for cattle and/or sheep. An existing transmission line passes the site on the west side and features lattice towers until the aqueduct, where single steel poles complete the route to the Buttonwillow substation. The steel pole line traverses an agricultural (cotton and orchard) area and passes at least eight dwellings.

The California Aqueduct is adjacent to the northern boundary of the site. As with the McKittrick site, this site would use West Kern Water District water and would not constitute a "new use" of California Aqueduct water.

A natural gas supply line is about 0.5 mile to the west of the site and the plant's natural gas pipeline would cross open fields to reach it. Potable water would need to be provided by on site wells.

SITE 3: CYMRIC – KERN COUNTY

Site 3 is located near Cymric Road southwest of the intersection of Lokern Road and Highway 33. It is about 15 miles west of Buttonwillow and about two miles west of Highway 33 and appears to be an unused part of an existing oilfield. The transmission line would parallel the Diablo-Midway #2 transmission line (immediately adjacent on the north) to the Buttonwillow substation.

The California Aqueduct is about 8 miles to the east where it is crossed by Lokern Road; the pipeline conveying the raw water supply would follow Lokern Road. The West Kern Water District also serves this site and use of California Aqueduct water would not constitute a "new use". Alternatively, using "process" water from the oil fields as cooling water may be feasible at this site. Potable water would be supplied by on site wells.

The natural gas supply line would extend about 5 miles to the east of the site, connecting with a large supply pipeline. The plant's natural gas supply pipeline would impact many sensitive biological resources.

SITE 4: BELRIDGE – KERN COUNTY

This site is located about 18 miles northwest of Buttonwillow and is on the southwest corner of the intersection of Highway 33 and Lerdo Road. It, like the Cymric site, appears to be an unused part of an existing oilfield. The transmission line would follow Highway 33 until it meets the Diablo-Midway #2 transmission line, and would then parallel the Diablo-Midway #2 transmission line to the Midway substation at Buttonwillow.

The California Aqueduct is about 5 miles to the east where Lerdo Road crosses it. Unlike the McKittrick, Elk Hills Road and Cymric sites, use of aqueduct water would constitute a "new use". However, this site holds the potential for using "process" water as cooling water, as at the Cymric site. Potable water would be provided by on site wells.

SITE 5: KETTLEMAN CITY - EAST – KINGS COUNTY

Kettleman City is a small, unincorporated community that has a population that is about 95% Hispanic. The residential area itself is about 1 mile north of the commercial area that lies immediately east of the I-5/Highway 41 interchange. Within this 1 mile separation, from west to east, lies a reach of the California Aqueduct, three large electrical transmission lines (which are adjacent to each other). This alternative site is located adjacent to the PG&E pipeline on land that is zoned, unlike the remainder of the alternative sites, heavy industrial. The land is overgrown with weeds and appears unused.

Because there is no large substation nearby, an interconnection with the adjacent 230 kV transmission line via a switching station would be needed. The distance

from the switchyard to the transmission line is estimated at 1,000 feet or less. The natural gas pipeline would be about 500 feet long.

Both the raw water supply line and the potable water supply pipelines would be about one mile long each and would be routed down existing roads. Use of aqueduct water would constitute a “new use”.

SITE 6: KETTLEMAN CITY - WEST – KINGS COUNTY

This alternative site is in low foothills about 1 mile west of the I-5/Highway 41 interchange and is adjacent to the north side of Highway 41. It is not visible from either Kettleman City or I-5, but would present serious visual resources concerns due to its relative location to Highway 41 which is a well-traveled road from I-5 to Paso Robles and the coast beyond.

The transmission line would be about five miles long and would follow Highway 41 east through the commercial area. A small switching station at the interconnection site with the large north-south 230 kV transmission line at the Kettleman City East site would be required.

Aqueduct water and potable water would have to be routed about four and two miles, respectively, to the site along the shoulder of Highway 41. Again, use of aqueduct water would constitute a “new use”. A natural gas pipeline would extend north of the site to a connection one-mile away.

SITE 7: GATES – FRESNO COUNTY

The Gates alternative site is located about 15 miles east of Coalinga, five miles south of Huron, and about three miles east of the I-5/Jayne Road interchange. PG&E’s Gates substation is about two miles to the west. Lassen Road intersects Jayne Road at the site; the former leads north to the community of Huron. The primary land use is the growing of cotton; however, some vineyards and orchards lie nearby. Directly across Lassen Road from the site is a medium-sized agricultural processing plant.

A two-mile long transmission would go west from the site to the Gates substation and would follow Jayne Road. The raw water pipeline to the California Aqueduct would be about three miles long and would lie alongside the north side of Jayne Road. Use of aqueduct water would be a “new use”.

A PG&E natural gas pipeline is in the vicinity of the substation, but is west of the substation and is about 2.5 miles away from the alternative plant site. The interconnecting natural gas pipeline would follow Jayne Road, too.

SITE 8: PANOCHE ROAD – FRESNO COUNTY

Located about 35 miles west of the city of Fresno and about three miles east-northeast of the I-5/Panoche Road interchange, this site is near PG&E’s Panoche

substation. The closest community is Mendota, which is about eight miles to the northeast. The land use is primarily cultivation of cotton.

The transmission line would follow Panoche Road to the substation one mile away. The California Aqueduct is about five miles to the east and is crossed by Panoche Road. Use of this water would be a "new use". A PG&E natural gas pipeline is in the vicinity of the substation and lies between the alternative site and the substation.

SITE 9: SANTA NELLA – MERCED COUNTY

The Santa Nella site is in western Merced County and is almost centered within a large triangular area bounded by I-5 and state Highways 33 and 152. To the north is Santa Nella, an unincorporated community that is dominated by commercial areas catering to travelers. A small residential area in Santa Nella has been expanded in recent years with the building of a new subdivision adjacent to the north-south stretch of Highway 33. These newer houses are about 2.5 miles or less from the alternative site. A second commercial area that caters to travelers (motel, gasoline stations and fast-food restaurants) is about 3 miles to the southwest of the alternative site at the intersection of Highways 152/33 and 33. In addition, this area also has a KOA campground on the east side.

A large electrical power substation lies to the west and almost adjacent to this second commercial area. A new, 4-mile long, 230 kV electric transmission line would interconnect the alternative site to the substation via Hilldale Road and Highway 152/33.

Both the California Aqueduct and a Pacific Gas and Electric (PG&E) natural gas pipeline cross the center of the large triangular area roughly west-northwest to east-southeast. The aqueduct conveys water directly from San Luis Reservoir and O'Neill Forebay which are, respectively, about 4 and 1.5 miles to the west of the alternative site. Use of aqueduct water would constitute a "new use".

Standing immediately north of the aqueduct and crossed by a natural gas pipeline, the alternative site appears to be used as a hay field. Hilldale Avenue runs north from Highway 33/152 past the site and dead ends at the Delta-Mendota canal about ¼ mile north of the site. One residence is situated at the intersection of Hilldale Avenue and Highway 33/152 about one mile directly south of the alternative site. This property is used to sell agricultural products from a "fruit stand". Real estate brokerage signs on both I-5 and Highway 33/152 suggest that the land containing the alternative site is available for purchase.

GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Jeri Zene Scott

INTRODUCTION

The La Paloma Generating Project General Conditions including the Compliance Monitoring and Closure Plan (Compliance Plan) has been established as required by Public Resources Code, section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in conjunction with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

General conditions that:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
- establish requirements for facility closure plans.

Specific conditions of certification which are found following each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of verifying that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

A CPM will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;

2. resolving complaints;

3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;

4. documenting and tracking compliance filings; and,

5. ensure that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission staff when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, it should be understood that the approval would involve all appropriate staff and management.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence and to preclude any last minute, unforeseen issues from arising.

ENERGY COMMISSION RECORD

The Energy Commission shall maintain as a public record in either the Compliance file or Docket file for the life of the project (or other period as required):

1. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;

2. all monthly and annual compliance reports filed by the project owner;

3. all complaints of noncompliance filed with the Energy Commission; and,

4. all petitions for project or condition changes and the resulting staff or Energy Commission action taken.

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate.

ACCESS

The CPM has the responsibility to ensure that the project is designed, constructed, operated and closed in compliance with the terms and conditions of the Commission Decision. Without access to the facility, it is virtually impossible to determine whether or not the project owner is complying with the conditions of certification. Therefore, the CPM, designated staff, and delegated agencies or consultants, shall be guaranteed and granted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits.

COMPLIANCE RECORD

The compliance record serves as verification that the project was designed, constructed and operated in compliance with the terms and conditions of the Commission Decision. The documents contained in the compliance record demonstrate that the project owner, or its designated agents, complied with the conditions of certification. The project owner shall maintain project files on-site or at an alternative site approved by the CPM, for the life of the project. The files shall contain copies of all “as-built” drawings, all documents submitted as verification for conditions, and all other project-related documents for the life of the project, unless a lesser period is specified by the conditions of certification.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given access to the files.

COMPLIANCE VERIFICATIONS

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary, by the CPM, in most cases without Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

1. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;

2. appropriate letters from delegate agencies verifying compliance;

3. Energy Commission staff audit of project records; and/or

4. Energy Commission staff inspection of mitigation and/or other evidence of mitigation.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal**. The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification Submittal to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

COMPLIANCE REPORTING

The project owner shall provide compliance reports to keep the CPM apprised of what is occurring on the power plant site during both the construction and operation phases. There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports.

During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

COMPLIANCE MATRIX

A compliance matrix is to be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix will provide the CPM with the current status of compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area;

2. the condition number;

3. a brief description of the verification action or submittal required by the condition;

4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);

5. the expected or actual submittal date;

6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable; and

7. an indication of the compliance status for each condition (e.g., “not started”, “in progress” or “completed date”).

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

MONTHLY COMPLIANCE REPORT

During construction of the project, the project owner or authorized agent shall submit Monthly Compliance Reports within 10 working days after the end of each reporting month. The Monthly Compliance Report allows the CPM to keep track of the progress being made by the project owner during the construction phase. The CPM uses the Monthly Compliance Report to schedule site visits and to maintain a database of the project owner’s compliance with the conditions of certification.

Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;

2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;

3. an initial, and thereafter updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);

4. a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;

5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;

6. a cumulative listing of any approved changes to conditions of certification;

7. a listing of any filings with, or permits issued by, other governmental agencies during the month;

8. a projection of project compliance activities scheduled during the next two months;

9. a listing of the month's additions to the on-site compliance file; and

10. any requests to dispose of items that are required to be maintained in the project owner's compliance file.

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date that the project was approved, unless the project owner notifies the CPM in writing that a delay is warranted. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

ANNUAL COMPLIANCE REPORT

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The CPM uses the Annual Compliance Report along with periodic site visits to ensure that the project owner is complying with on-going or operational conditions of certification.

The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);

2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;

3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;

4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;

5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;

6. a listing of filings made to, or permits issued by, other governmental agencies during the year;

7. a projection of project compliance activities scheduled during the next year;

8. a listing of the year's additions to the on-site compliance file, and

9. an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].

CONFIDENTIAL INFORMATION

Any information, which the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, which is determined to be confidential, shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

DEPARTMENT OF FISH AND GAME FILING FEE

Pursuant to the provisions of Fish and Game Code, section 711.4, the project owner must remit to the California Department of Fish and Game (CDFG) a filing fee in the amount of eight hundred and fifty dollars ($850). The fee must be paid on or before the tenth day following the Energy Commission Business Meeting at which the project was approved. No construction may commence until the fees have been paid in full, and proof of payment is submitted to the CPM.

The project owner shall submit a copy of the CDFG receipt to the CPM within 30 days of the Energy Commission Business Meeting in which the project was approved. The receipt shall identify the project, indicate the date paid and specify the amount paid.

FACILITY CLOSURE

INTRODUCTION

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting which will exist at the time of closure. Laws, ordinances, regulations and standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure**.**

PLANNED CLOSURE

This planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency.

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes both when an owner is implementing the on-site contingency plan, and when the project owner has abandoned the project.

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

In order that a planned facility closure does not create adverse impacts, a closure process, that will provide for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the

CPM). The project owner shall file 125 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall a) identify and discuss impacts associated with the proposed facility closure activities and a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project, b) identify any facilities or equipment intended to remain on site after closure and the reason, and any future use, and c) address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

The project owner shall not commence facility closure activities, with the exception of measures to eliminate any immediate threats to health and safety or the environment, until Commission approval of the facility closure plan is obtained.

UNEXPECTED TEMPORARY CLOSURE

In order to ensure that public health and safety and the environment are protected in the event of an unexpected temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less that 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may recommend revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for temporary closures of more than 90 days (unless other arrangements are agreed to by the CPM), the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment (also see specific conditions of certification for the technical areas of Hazardous Materials Management, Transmission Line Engineering and Waste Management).

In the event of an unexpected temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan.

The project owner shall keep the CPM informed of circumstances and expected duration of the closure.

If it is determined that a temporary closure is likely to be permanent or for a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be submitted to the CPM within 90 days of the determination (or other period of time agreed to by the CPM).

UNEXPECTED PERMANENT CLOSURE

In order to ensure that public health and safety and the environment are protected in the event of an unexpected permanent facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner (even in an abandonment scenario).

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less that 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may recommend revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. (Also see specific conditions of certification for the technical areas of Hazardous Materials Management, Transmission Line Engineering and Waste Management). Furthermore, the plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the event of abandonment.

In the event of an unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

DELEGATE AGENCIES

To the extent permitted by law, the Energy Commission may delegate authority for compliance verification and enforcement to various state and local agencies that have expertise in subject areas where specific requirements have been established as a condition of certification. If a delegate agency does not participate in this program, the Energy Commission staff will establish an alternative method of

verification and enforcement. Energy Commission staff reserves the right to independently verify compliance.

In performing construction and operation monitoring of the project, the Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). The Commission staff retains this authority when delegating to a local CBO. Delegation of authority for compliance verification includes the authority for enforcing codes, the responsibility for code interpretation where required, and the authority to use discretion as necessary, in implementing the various codes and standards.

Whenever an agency's responsibility for a particular area is transferred by law to another entity, all references to the original agency shall be interpreted to apply to the successor entity.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code, sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision.

Moreover, to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, regulations, and standards, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure are described below:

INFORMAL DISPUTE RESOLUTION PROCEDURE

The following procedure is designed to informally resolve disputes concerning interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the

Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

REQUEST FOR INFORMAL INVESTIGATION

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

REQUEST FOR INFORMAL MEETING

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (14) days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;

2. secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary; and

3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner.

After the conclusion of such a meeting, the CPM shall promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum that fairly and accurately identifies the positions of all parties and any

conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et. seq.

FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's Chief Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, STAFF CHANGES AND VERIFICATION CHANGES

The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; 3) transfer ownership or operational control of the facility; or 4) change a condition verification requirement.

A petition is required for **amendments** and for **insignificant (staff) changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209. The criteria that determine which type of change process applies are explained below.

AMENDMENT

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol (and in some cases the verification) portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

INSIGNIFICANT STAFF CHANGE

The proposed change will be processed as an insignificant staff change if it does not require changing the language in a condition of certification, does not have a potential significant environmental impact, and will not cause the project to violate laws, ordinances, regulations or standards.

VERIFICATION CHANGE

The proposed change will be processed as a verification change if it involves only the language in the verification portion of the condition of certification. This procedure can only be used to change verification requirements that are of an administrative nature, usually the timing of a required action. In the unlikely event that verification language contains technical requirements, the proposed change must be processed as an amendment.

KEY EVENT LIST

PROJECT _____ DATE ENTERED

DOCKET # _____ PROJECT MANAGER

EVENT DESCRIPTION	***DATE ASSIGNED***
Date of Certification	
Start of Construction	
Completion of Construction	
Start of Operation (1st Turbine Roll)	
Start of Rainy Season	
End of Rainy Season	
Start T/L Construction	
Complete T/L Construction	
Start Fuel Supply Line Construction	
Complete Fuel Supply Line Construction	
Start Rough Grading	
Complete Rough Grading	
Start of Water Supply Line Construction	
Complete Water Supply Line Construction	
Start Implementing Erosion Control Measures	
Complete Implementing Erosion Control Measures	

GLOSSARY OF TERMS AND ACRONYMS

A

A	Ampere
AAL	All aluminum (electricity conductor)
AADT	Annual Average Daily Traffic
AAQS	Ambient Air Quality Standards
ABAG	Association of Bay Area Governments
ABB	Asea Brown Boveri
AC	Alternating Current
ACEC	Area of Critical Environmental Concern
ACGIH	American Conference of Government and Industrial Hygienists
ACE	Argus Cogeneration Expansion Project Army Corps of Engineers
ACSR	Aluminum Covered Steel Reinforced (electricity conductor)
AERA	
AFC	Application for Certification
AFY	acre-feet per year
AHM	Acutely Hazardous Materials
AIHA	American Industrial Hygienists Association
ANSI	American National Standards Institute
APCD	Air Pollution Control District
APCO	Air Pollution Control Officer
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	Air Resources Board
ARCO	Atlantic Richfield Company
ASAE	American Society of Architectural Engineers
ASHRAE	American Society of Heating Refrigeration & Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ATC	Authority to Construct
AWS	American Welding Society

B

BACT	Best Available Control Technology
BAF	Basic American Foods
BARCT	Best Available Retrofit Control Technology
bbl	barrel
BCF	billion cubic feet
Bcfd	billion cubic feet per day
b/d	barrels per day
BO	Biological Opinion
BLM	Bureau of Land Management

BR	Biennial Report
BRMIMP	Biological Resources Mitigation and Monitoring Plan
Btu	British thermal unit

C

CAA	U.S. Clean Air Act
CAAQS	California Ambient Air Quality Standards
CALEPA	California Environmental Protection Agency
Cal-OSHA	California Occupational Safety and Health Administration
CA-PX	California Power Exchange
CALTRANS	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CATEF	California Toxic Emissions Factors
CBC	California Building Code
CBO	Chief Building Official
CCAA	California Clean Air Act
CDF	California Department of Forestry
CDFG	California Department of Fish and Game
CEERT	Coalition for Energy Efficiency and Renewable Technologies
CEM	Continuous Emissions Monitoring
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CESA	California Endangered Species Act
CFB	Circulating Fluidized Bed
CFCs	Chloro-fluorocarbons
Cfm	cubic feet per minute
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLUP	Comprehensive Land Use Plan
CNEL	Community Noise Equivalent Level
CNLM	Center for Natural Lands Management
CO	Carbon Monoxide
CO2	Carbon Dioxide
COC	Condition of Certification
COI	California Oregon Intertie
CPCN	Certificate of Public Convenience & Necessity
CPM	Compliance Project Manager
CPUC	California Public Utilities Commission
CRTR	Cultural Resources Technical Report

CT	Combustion Turbine Current Transformer
CTG	Combustion Turbine Generator
CUPA	Certified Unified Program Agency
CURE	California Unions for Reliable Energy

D

dB	decibel
dB(A)	decibel on the A scale
DC	Direct Current
DCS	Distributed Control System
DCTL	Double Circuit Transmission Line
DEIR	Draft Environmental Impact Report
DEIS	Draft Environmental Impact Statement
DFG	California Department of Fish and Game
DHS	California Department of Health Services
DISCO	Distribution Company
DOC	Determination of Compliance
DOE	(U.S.) Department of Energy
DOG	(California) Department of Oil and Gas
DSM	Demand Side Management
DTC	Desert Tortoise Council
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources

E

EDF	Environmental Defense Fund
Edison	Southern California Edison Company
EDR	Energy Development Report
EEGL	Emergency Response Planning Guidelines
EFS&EPD	Energy Facilities Siting and Environmental Protection Division
EIA	(U.S.) Energy Information Agency
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJ	Environmental Justice
ELFIN	Electric Utility Financial and Production Simulation Model
EMF	Electric And Magnetic Field
EOR	East of River (Colorado River)
EPA	(U.S.) Environmental Protection Agency
EPA-ARI	(U.S.) Environmental Protection Agency-Accidental Release Information Program
EPRI	Electric Power Research Institute
ER	Electricity Report

ERC	Emission Reduction Credit {offset}
ERNS	Emergency Response Notification System
ERPG	Emergency Response Planning Guidelines
ESA	Endangered Species Act (Federal) Environmental Site Assessment
ETSR	Energy Technologies Status Report

F

FAA	Federal Aviation Administration
FBE	Functional Basis Earthquake
FCAA	Federal Clean Air Act
FCC	Federal Communications Commission
FE	Federall (listed) Endanered
FEIR	Final Environmental Impact Report
FERC	Federal Energy Regulatory Commission
FIP	Federal Implementation Plan
FLPMA	Federal Land Policy Management Act
FONSI	Finding of No-Significant Impact
FP	(State) Fully Protected
FSA	Final Staff Assessment
FT	Federally (listed) Threatened

G

GE	General Electric
GEP	Good Engineering Practice
GIS	Gas Insulated Switchgear Geographic Information System
gpd	gallons per day
gpm	gallons per minute
GW	gigawatt
GWh	gigawatt hour

H

H_2S	Hydrogen Sulfide
HCP	Habitat Conservation Plan
HHV	Higher Heating Value
HRA	Health Risk Assessment
HRSG	Heat Recovery Steam Generator
HV	High Voltage
HVAC	Heating, Ventilation and Air Conditioning

I

IAR	Issues and Alternatives Report
IDLH	Immediately Dangerous to Life and Health Level
IEA	International Energy Agency
IEEE	Institute of Electrical & Electronics Engineers
IID	Imperial Irrigation District
IIPP	Injury and Illness Prevention Program

IIR	Issues Identification Report
IMPLAN	Impact Analysis for Planning
IOU	Investor-Owned Utility
IS	Initial Study
ISO	Independent System Operator
ISCST3	Industrial Source Complex Short-Term model, Version 3

J

JES	Joint Environmental Statement

K

KCFD	Kern County Fire Department
KCM	thousand circular mils (also KCmil) (electricity conductor)
KGRA	Known Geothermal Resource Area
km	kilometer
KOP	Key Observation Point
KRCC	Kern River Cogeneration Company
kV	kilovolt
KVAR	kilovolt-ampere reactive
kW	kilowatt
kWe	kilowatt, electric
kWh	kilowatt hour
kWp	peak kilowatt

L

LADWP	Los Angeles Department of Water and Power
LAER	Lowest Achievable Emission Rate
lbs	pounds
lbs/hr	pounds per hour
lbs/MMBtu	Pounds Per Million British Thermal Units
LORS	Laws, Ordinances, Regulations and Standards
LOS	Level of Service

M

m (M)	meter, million, mega, milli or thousand
MCE	Maximum Credible Earthquake
MCF	thousand cubic feet
MCL	Maximum Containment Level
MCM	thousand circular mil (electricity conductor)
$\mu g/m^3$	micro grams (10-6 grams) per cubic meter
MG	milli gauss
mgd	million gallons per day
MOU	Memorandum of Understanding
MPE	Maximum Probable Earthquake
m/s	meters per second
MS	Mail Station
MVAR	megavolt-ampere reactive

MW	megawatt (million watts)
MWh	megawatt hour
MWp	peak megawatt

N

N-1	One transmission circuit out
N-2	Two transmission circuits out
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Council
NCR	Non-Conformance Report
NEC	National Electrical Code
NEPA	National Energy Policy Act National Environmental Policy Act
NERC	National Electric Reliability Council
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Health and Safety
NMHC	nonmethane hydrocarbons
NO	nitrogen oxide
NOI	Notice of Intention
NOL	North of Lugo
NO_x	nitrogen oxides
NO2	nitrogen dioxide
NOP	Notice of Preparation (of EIR)
NOV	Notice of Violation
NRC	National Research Council National Response Center
NRDC	Natural Resources Defense Council
NSPS	New Source Performance Standards
NSR	New Source Review

O

O_3	Ozone
OASIS	Open Access Same-Time Information System
OCB	Oil Circuit Breaker
OCSG	Operating Capability Study Group
O&M	Operation and Maintenance
OLM	Ozone Limiting Method
OSHA	Occupational Safety and Health Administration (or Act)

P

PAH	Polycyclic Aromatic Hydrocarbons
PG&E	Pacific Gas & Electric Company
PDCI	Pacific DC Intertie
PHC(S)	Prehearing Conference (Statement)
PIFUA	Federal Powerplant & Industrial Fuel Use Act of 1978
PM	Project Manager

	particulate matter
PMPD	Presiding Member's Proposed Decision
PM_{10}	Particulate matter 10 microns and smaller in diameter
$PM_{2.5}$	Particulate matter 2.5 microns and smaller in diameter
PPE	Personal Protective Equipment
ppb	parts per billion
ppm	parts per million
ppmvd	parts per million by volume, dry
ppt	parts per thousand
PSA	Preliminary Staff Assessment
PRC	(California) Public Resources Code
PSD	Prevention of Significant Deterioration
PT	Potential Transformer
PTO	Permit to Operate Participating Transmission Owner
PU	per unit
PURPA	Federal Public Utilities Regulatory Policy Act of 1978
PV	Palo Verde photovoltaic
PX	Power Exchange

Q

QA/QC	Quality Assurance/Quality Control
QF	Qualifying Facility

R

RACT	Reasonably Available Control Technology
RCRA	Resource Conservation and Recovery Act
RDF	Refuse Derived Fuel
RE	Resident Engineer
RMP	Risk Management Plan
ROC	Report of Conversation Reactive Organic Compounds
ROG	Reactive Organic Gas
ROW	Right-of-Way
RWQCB	Regional Water Quality Control Board

S

SARA	Superfund Amendments and Reauthorization Act of 1986
SB	Senate Bill
SCAB	South Coast Air Basin
SCE	Southern California Edison Company
SCFM	standard cubic feet per minute
SCH	State Clearing House
SCIT	Southern California Import Transmission
SCR	Selective Catalytic Reduction

SCTL	Single Circuit Transmission Line
SE	State (listed) Endangered
SHPO	State Office of Historic Preservation
SIC	Standard industrial classification
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
SMP	Safety Management Plan
SNCR	Selective Noncatalytic Reduction
SNG	Synthetic Natural Gas
SO_2	Sulfur Dioxide
SO_x	Oxides of Sulfur
SO_4	Sulfates
SoCalGas	Southern California Gas Company
SSC	Species of Special Concern
ST	State (listed) Threatened
STEL	Short Term Exposure Limit
STPEL	Short Term Public Emergency Limit(s)
STIG	Steam Injected Gas Turbine
SWP	State Water Project
SWRCB	State Water Resources Control Board

T

TAC	Toxic Air Contaminant
Tbtu	trillion Btu
TCF	trillion cubic feet
TCM	Transportation Control Measure
TDS	Total Dissolved Solids
TE	Transmission Engineering
TEOR	Thermally Enhanced Oil Recovery
TL	Transmission Line (or lines
T-Line	Transmission Line
TLV	Threshold Limit Value
TOG	Total Organic Gases
TPD	tons per day
TPY	tons per year
TS&N	Transmission Safety and Nuisance
TSE	Transmission System Engineering
TSIN	Transmission Services Information Network
TSP	Total Suspended Particulate Matter

U

UBC	Uniform Building Code
UDC	Utility Displacement Credits
UDF	Utility Displacement Factor
UEG	Utility Electric Generator

UFC	Uniform Fire Code
USC(A)	United States Code (Annotated)
USCOE	U.S. Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

V

VISCREEN	
VOC	Volatile Organic Compound(s)
VRM	Visual Resource Management

W

W	Watt
WAA	Warren-Alquist Act
WEPEX	Western Energy Power Exchange
WHO	World Health Organization
WKWD	West Kern Water District
WICF	Western Interconnection Forum
WIEB	Western Interstate Energy Board
WOR	West of River (Colorado River)
WPLT	Western Pluvial Lakes Tradition
WRTA	Western Region Transmission Association
WSCC	Western System Coordination Council
WSPP	Western System Power Pool

PREPARATION TEAM

Executive Summary……Marc S. Pryor

Introduction ..... Marc S. Pryor

Project Description..... Marc S. Pryor

Need Conformance..... Tim Ewing

Air Quality ..... Keith Golden

Public Health..... Obed Odoemelam

Worker Safety and Fire Protection.....Ellie Townsend-Smith

Transmission Line Safety and Nuisance..... Obed Odoemelam

Hazardous Materials..... Joe Loyer

Waste Management.....Ellie Townsend-Smith

Land Use ..... Amanda Stennick

Traffic and Transportation..... David Flores

Noise.....Steve Baker

Visual Resources..... David Flores

Cultural Resources .....Kathryn Matthews

Socioeconomics..... Dale Edwards

Biology.....Rick York

Water and Soils ..... Joe O'Hagan

Paleontological Resources ..... Robert Anderson

Facility Design .....M. Kisabuli

Reliability .....Steve Baker

Efficiency .....Steve Baker

Transmission System Engineering .....Mark Hester

Alternatives.....Marc S. Pryor and Eileen Allen

Compliance Monitoring Plan and General Conditions.....Jeri Zene Scott

Glossary of Terms and Acronyms .....Bert Fegg

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