Final Staff Assessment

WESTERN MIDWAY SUNSET POWER PROJECT

Application For Certification (99-AFC-9)
Kern County

CALIFORNIA ENERGY COMMISSION

STAFF REPORT

NOVEMBER 2000
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Gray Davis, *Governor*

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CALIFORNIA ENERGY COMMISSION

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EXECUTIVE SUMMARY

Testimony of Jack W. Caswell

INTRODUCTION

This Final Staff Assessment (FSA) contains the California Energy Commission (Energy Commission) staff's evaluation of the Western Midway Sunset Cogeneration Company Project, (referred to as either "Western MSCC" or "the applicant") Application for Certification (AFC) (99-AFC-9). The Western MSCC 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, presenting staff's independent analysis. It examines engineering, environmental, and public health and safety aspects of the Western MSCC project 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 December 22, 1999, the applicant filed an AFC with the Energy Commission to construct and operate the Western MSCC power plant. On March 8, 2000, 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: the AFC; Preliminary Staff Assessment (PSA) comments, subsequent amendments; responses to data requests; supplementary information from local, state, and federal agencies; interested individuals or organizations; existing documents including publications; independent field studies, and research.

PROJECT DESCRIPTION

The proposed Western MSCC project will be a nominal 500 megawatt (MW), natural gas-fired, combined cycle power plant, with two combustion turbine generators (CTG), two heat recovery steam generators (HRSG), which will supply one steam turbine generator (STG). The maximum design capacity of the facility will be 556 MW with a net output of 546 MW. The Western MSCC project will occupy approximately 10 acres and will be located adjacent to the existing 225 MW MSCC power plant located approximately 2.5 miles east of Derby Acres in western Kern County, California. The Western MSCC project will employ five new permanent positions in addition to the existing MSCC power plant staff. The MSCC site address is 3466 Crocker Springs Road, P.O. Box 457, Fellows, CA.

The proposed power plant will use existing MSCC facilities, pipelines, and construction corridors thereby minimizing disturbance of endangered species habitats, cultural and paleontological resources. It is the intent of the project to transmit power through a new 19-mile 230,000 volt transmission line to be constructed parallel to and within the existing 230,000 volt transmission line corridor, which connects the existing MSCC plant to PG&E's Midway Substation at Buttonwillow, California.

The two existing gas pipelines currently providing natural gas for the existing MSCC power plant will also supply the Western MSCC Project. The existing gas lines are more than sufficient to supply both the Western MSCC project and the existing MSCC facility.

Water will be supplied by a new 1.8-mile pipeline from West Kern Water District (WKWD). It is the intent of MSCC to use water discharged from the new plant's operations. The reclaimed water will displace an equivalent amount of water from the West Kern County District and others. The existing MSCC plant system will provide all potable water and steam cycle makeup water required by the project. Water storage on site will make use of the existing 500,000 gallon MSCC water storage tank. The tank will act as a buffer to be drawn down in the daytime while being filled at night. The cooling tower basin will serve as the firewater reservoir for the Western MSCC plant, thus eliminating the need for a separate firewater storage tank. The Western MSCC project will use the existing reverse osmosis demineralizer water treatment system. The plant water reclamation system will collect cooling tower blowdown, Heat Recovery Steam Generator (HRSG) boiler blowdown, and evaporative cooler blowdown. The blowdowns will be routed to the MSCC facility for utilization. Water will be collected from washdown, storm water and equipment drains. These streams will be sent to a new oily water separator prior to discharge to the storm water retention area.

Emission control will be provided by Selective Catalytic Reduction (SCR). The SCR system consists of the reduction catalyst and an aqueous ammonia injection system. The SCR will use a high activity catalyst on a metal, ceramic or zeolite extruded support structure. The SCR will be located within the HRSG for effective $N0_x$ reduction. A continuous emissions monitoring system (CEMS) on each HRSG stack to sample, analyze, and record the concentrations of carbon monoxide, oxides of nitrogen, and diluent (oxygen/carbon dioxide) in the flue gas.

The Western MSCC project would be operated as a merchant power facility, selling its energy via direct sales agreements and in the spot market via the California Power Exchange. Energy output and operational levels would vary according to demand in the deregulated California energy market. Electricity prices and operational levels would not be subject to California Public Utilities Commission (CPUC) regulation.

STAFF'S ASSESSMENT

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

- the environmental setting of the proposal;
- impacts on public health and safety, and measures proposed to mitigate any impacts;
- environmental impacts, and measures proposed to mitigate any 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 closure;
- project alternatives;
- compliance of the project with all applicable laws; ordinances, regulations, standards (LORS) during construction, 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 19 technical areas:

Biology	Reliability
Cultural Resources	Socioeconomics
Efficiency	Soil
Facility Design	Traffic and Transportation
Land Use	Transmission Line Safety & Nuisance
Geology	Waste Management
Hazardous Material	Water
Noise	Worker Safety
Paleontology	Visual Resources
Public Health	

INCOMPLETE ANALYSES

All but two technical areas are substantially complete. Four agencies San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD), United States Fish & Wildlife Service (USF&WS), California Independent System Operator (Cal ISO), and the Central Valley Regional Water Quality Control Board (CVRWQCB) have not responded to our PSA or provided necessary documents.

AIR QUALITY

The San Joaquin Valley Unified Air Pollution Control District (District) has yet to issue a Final Determination of Compliance (FDOC). The applicant expects the

FDOC to be issued by mid-December 2000 by the District prior to the start of evidentiary hearings. Staff has included conditions of certification that address the Preliminary Determination of Compliance.

BIOLOGICAL RESOURCES

The biological resources analysis contained in this FSA is as complete as possible, pending the USF&WS Biological Opinion. USF&WS has not been able to provide an exact date this document will be submitted. Receipt of the federal Biological Opinion and California Department of Fish and Game (CDFG) the Incidental Take Permit does not preclude certification. Staff has included mitigation measures and conditions of certification to address the anticipated requirements of both USFWS and CDFG.

TRANSMISSION SYSTEM ENGINEERING

The Independent System Operators (Cal ISO) is reviewing the Pacific Gas and Electric (PG&E) Detailed Facilities Study (DFS). Currently the analysis provided by PG&E appears to have incorrect power flow calculations and will require new calculations prior to final comment on the DFS by the Cal ISO. It is anticipated that the Cal ISO will provided the information by mid-December 2000, prior to the start of the evidentiary hearings.

WATER

The water Resources analysis contained in this FSA is as complete as possible pending the waste discharge requirements from the CVRWQCB. Staff is unable to determine the exact date when the waste discharge requirements will be available. Staff has included a condition of certification to address this issue.

STAFF RECOMMENDATION

Commission staff has concluded that if all mitigation measures and recommended conditions of certification project are adopted by the Commission and implemented by the Applicant, all applicable LORS will be complied with and no significant adverse environmental impacts will result from the Western MSCC project. Staff therefore recommends certification of the Western Midway Sunset Cogenration Company Project subject to all conditions of certification as proposed in this final staff assessment.

WESTERN MIDWAY SUNSET COGENERATION COMPANY PROJECT
FINAL STAFF ASSESSMENT

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INTRODUCTION

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PURPOSE OF THIS REPORT

The Final Staff Assessment (FSA) is the California Energy Commission (Energy Commission) staff's independent analysis of the Western Midway Sunset Cogeneration Company Project's (Western MSCC) Application for Certification (AFC). The FSA is a staff document. It is neither a Committee document, nor a draft decision or proposed decision. The FSA describes the following:

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

The analyses contained in this FSA are based upon information from the: 1) AFC, 2) subsequent amendments, 3) responses to data requests, 4) supplementary information from local and state agencies and interested individuals, 5) existing documents, publications; 6) independent field studies and research 7) comments on the Preliminary Staff Assessment (PSA). The analyses for most technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of "verification." The 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 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; if any remaining unmitigated impacts are identified, staff proposes additional mitigation measures and project alternatives. 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), 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 the California Environmental Quality Act. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Resources Agency (Pub. Resources Code, section 21080.5 and Cal. Code Regs., tit. 14, section 15251 (k)).

The staff 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 comments received from agencies, the public and 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 this 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 circulated 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 FSA.

PROJECT DESCRIPTION

Testimony of Jack W. Caswell

NATURE AND PURPOSE OF THE PROJECT

The Western Midway Sunset Cogeneration Company (referred to as either "Western MSCC" or "the applicant") proposes to construct and operate the Western MSCC power plant, a nominal 500-megawatt (MW) natural gas-fired combined cycle facility located in the southwest region of western Kern County. Western MSCC is a wholly owned subsidiary. The applicant's objective is to operate an electrical generating facility that utilizes existing infrastructure to supply economic, reliable, environmentally sound electrical energy, and capacity to the restructured California energy market.

PROJECT LOCATION

The site is about 40 miles southwest of Bakersfield, California, and 2.5 miles west of the unincorporated community of Derby Acres, California. The Proposed facility is in section 17, Township 31 South, Range 22 East, Mount Diablo Base and Meridian on West Crocker Springs Road. The 10-acre site is adjacent to the existing MSCC facility site. State Highway 33 runs northwest & southeast approximately 2.5 miles east of the site.

PROJECT DESCRIPTION

POWER PLANT

The proposed Western MSCC project will be a nominal 500 megawatt (MW), natural gas-fired, combined-cycle power plant, with two combustion turbine generators (CTG), and two heat recovery steam generators (HRSG) which will supply one steam turbine generator (STG). The maximum design capacity of the facility will be 556 MW with a net output of 546 MW. The Western MSCC project will occupy approximately 10 - acres and will be located adjacent to the existing 225 MW MSCC power plant located approximately 2.5 miles east of Derby Acres in western Kern County, California. The more than $200 million Western MSCC project will employ five new permanent positions in addition to the existing MSCC power plant staff.

The proposed power plant will use existing MSCC facilities, pipelines, and construction corridors thereby minimizing disturbance of endangered species habitats, cultural and paleontological resources. It is the intent of the project to transmit power through a new 19-mile 230 kv transmission line to be constructed parallel to and within the existing 230,000 volt transmission line corridor, which connects the existing MSCC plant to PG&E's Midway Substation at Buttonwillow, California.

The two existing gas pipelines currently providing natural gas for the existing MSCC power plant will also supply the natural gas fuel for the Western MSCC project. The

existing gas lines are more than sufficient to supply both the Western MSCC proposed facility and the existing MSCC facility.

A new 1.8-mile pipeline from West Kern Water District (WKWD) will supply water. It is the intent of MSCC to use water discharged from the new plant's operations. The reclaimed water will displace an equivalent amount of water from the West Kern Water District, and others. The existing MSCC plant system will provide all potable and steam cycle makeup water required by the project. Water storage on site will make use of the existing 500,000 gallon MSCC water storage tank. The tank will act as a buffer to be drawn down in the daytime while being filled at night. The cooling tower basin will serve as the firewater reservoir for the Western MSCC plant, thus eliminating the need for a separate firewater storage tank. Functionality of the tank will remain unchanged for the existing MSCC facility. The Western MSCC Project will use the existing reverse osmosis demineralizer water treatment system. The plant water reclamation system will collect cooling tower blowdown, Heat Recovery Steam Generator (HRSG) boiler blowdown, and evaporative cooler blowdown. The blowdowns will be routed to the MSCC facility for utilization. Water will be collected from washdown, storm water and equipment drains. These streams will be sent to a new oily water separator prior to discharge to the storm water retention area.

Emission control will be provided by Selective Catalytic Reduction (SCR). The SCR system consists of the reduction catalyst and an aqueous ammonia injection system. The SCR will use a high activity catalyst on a metal, ceramic or zeolite extruded support structure. The SCR will be located within the HRSG for effective $N0_x$ reduction. A continuous emissions monitoring system (CEMS) will be installed on each HRSG stack to sample, analyze, and record the concentrations of carbon monoxide, oxides of nitrogen, and diluent (oxygen/carbon dioxide) in the flue gas.

The Western MSCC project will be operated as a merchant power facility, selling its energy via direct sales agreements and in the spot market via the California Power Exchange. Energy output and operational levels will vary according to demand in the deregulated California energy market. Electricity prices and operational levels will not be subject to California Public Utilities Commission (CPUC) regulation.

Project Description Figure 1: shows the vicinity of the proposed power plant and existing facility, including the proposed routes for the transmission line and raw water supply lines. The power plant would be located on a 10-acre parcel. The vicinity is heavily developed and utilized by several oil companies for natural gas and oil production. Numerous petroleum recovery and storage facilities, electric power poles, high voltage transmission lines, and access roads characterize the area.

Project Description Figure 2: shows a plan view of the proposed 500-megawatt power plant's site arrangement. Major features of the power plant are: three power transformers, two 170 MW Combustion Turbine Generators (CTG), two Heat Recovery Steam Generator (HRSG); one shared 160 MW Steam Turbine Generator (STG); and one seven-cell cooling tower with high efficiency drift eliminators. Dry low NOx combustors will be used in each CTG. Each HRSG will be equipped with a Selective Catalytic Reduction (SCR) emission control system. The project includes a new 230 kv switchyard and a new 19-mile, 230 kV transmission line

connecting with Pacific Gas and Electric Company's (PG&E) transmission system (see the transmission line description below).

TRANSMISSION LINE

A 230 kv single circuit line will deliver power from plant to the interconnection at PG&E Midway substation near Buttonwillow, CA.. Two transmission line alternatives, Route B and C are identified (99-AFC-9 3.11 3.11.7.1) but are not considered as the best options to interconnection to the California electric transmission grid.

CONSTRUCTION AND OPERATION

The applicant plans to begin construction immediately after certification, which is expected to occur in March 2001 and run through October 2002 for a period of 20 months. Commercial operation should occur by the fall of 2002. There will be a peak work force of approximately 400 individuals and about 5 additional permanent facility operations personnel enhancing the existing MSCC power plant staff.

PROJECT DESCRIPTION Figure 1

Location of the Proposed Site and Related Facilities

PROJECT DESCRIPTION Figure 2

Power Plant Site Arrangement

AIR QUALITY

Testimony of Joseph M. Loyer

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the planned construction and operation of the Western Midway Sunset Cogeneration Company Project (Western MSCC) as proposed by the Midway Sunset Cogeneration Company (MSCC). 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 Western MSCC 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 Western MSCC project 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 Western MSCC project 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 rules and regulations:

RULE 2201 - NEW AND MODIFIED STATIONARY SOURCE REVIEW RULE

The main functions of the District'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 two pounds per day. In the case of the Western MSCC project, 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 lb./day
- Oxides of nitrogen - 10 tons/year
- Volatile organic compounds - 10 tons/year

The Western MSCC project 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 Western MSCC.

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 2520 – FEDERALLY MANDATED OPERATING PERMITS

Rule 2520 requires that a project owner file a Title V Operating Permit with the District within 12 months of commencing operation. A project is subject to this requirement if any of the following apply: the project is a major stationary source (under PSD definitions), it has the potential to emit greater than 100 tons per year of a criteria pollutant, that any equipment is subject to New Source Performance Standards, the project is subject to Title IV Acid Rain program, or the applicant is required to obtain a PSD permit from EPA. The Title V permit application requires that the owner submit information on the operation of the air polluting equipment, the emission controls, the quantities of emissions, the monitoring of the equipment as well as other information requirements.

RULE 2540 – ACID RAIN PROGRAM

Rule 2540 requires that a project greater than 25 MW and installed after November 15, 1990, must submit an acid rain program permit application to the District. The acid rain requirements will become part of the Title V Operating Program (Rule 2520). The specific requirements for the Western MSCC project will be discussed in the “Compliance with LORS – Local” later in this analysis.

RULE 4001 - NEW SOURCE PERFORMANCE STANDARDS

Rule 4001 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 are a function of the heat rate of the combustion, which in this case would be approximately 116 ppmv at 15% O2. In addition, the SO2 concentration shall be less than 150 ppmv and the sulfur content of the fuel shall no greater than 0.8 percent by weight.

RULE 4101 - VISIBLE EMISSIONS

Rule 4101 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

Rule 4201 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 4202 – PARTICULATE MATTER EMISSION RATE

Limits hourly particulate emissions based on the process rate of the process. Combustion of gaseous and liquid fuels are excluded from this rule, however the particulate emissions associated with the cooling tower are subject to the emission limits of this rule.

RULE 4703 - STATIONARY GAS TURBINES

Rule 4703 limits NOx concentrations to 12.2 ppm for the SCR controlled turbines and 21 ppm for the SCONOx controlled turbine. In addition there is a limit in CO concentrations of less than 200 ppm.

RULE 4801 - SO2 CONCENTRATION

Rule 4801 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)

Rule 8010 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

Rule 8020 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

Rule 8030 limits the fugitive dust emissions from the handling and storage of materials. 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

Rule 8060 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

Rule 8070 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 remove mud and dirt that has been tracked 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°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°F, with lows averaging 38°F. At the Maricopa weather station, a record high of 115°F and record low of 15°F was measured.

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 Western MSCC. 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 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 $\mu g/m^3$).

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.

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 $\mu g/m^3$)
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 $\mu g/m^3$	---
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.

The Western MSCC project 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 (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 three Westside Operators sites; Fellows, located approximately 6 miles southeast of the project site; Maricopa, located approximately 16 miles southeast of the project site; and McKittrick, which is located approximately six miles north 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.

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	Air Monitoring Station
PM10	24 hours	80	85	109	50	Fellows
	Annual	24.6	25.9	31.0	30	Fellows
NO2	1 hour	97	81	81	470	Maricopa
	Annual	13.6	16.3	15.6	100	Maricopa
CO	1 hour	2440	2303	2941	23,000	Fellows
	8 hour	1869	1985	2222	10,000	Fellows
SO2	1 hour	65	94	36	655	Fellows
	3 hours	36	57	27	1300	Fellows
	24 hours	13	20	14	130	Fellows
	Annual	1.5	1.8	1.8	80	Fellows

Additional ambient air quality data from the Air Resources Board's ozone monitor in Maricopa and Taft College PM10 monitor (10 miles 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 1998. There appears to be no clear trend of significant improvement in the ambient concentrations of these two pollutants.

AIR QUALITY Table 3
Ozone and PM10 Ambient Air Quality Data

Pollutant & Location		1998	1997	1996	1995	1994	1993
Ozone Maricopa	Max. conc.(ppm)	.14	.12	.12	.13	.13	.13
	# days exceed standard	56	24	63	85	78	85
PM10 Taft College	Max. conc ($\mu g/m^3$)	84	78	94	93	64	118
	# days exceed standard	6	6	12	15	6	13
	% of samples above 24-hour standard	10%	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)							

OZONE

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.

OZONE TRANSPORT

The transportation of ozone and ozone precursors (NOx and VOC) outside of their air district or air basin of origin may cause or contribute to exceedances of the ozone air quality standards in a down wind areas. In their most recent report on the contribution of upwind air basins to ozone violations in downwind air basins (CARB 1996), the California Air Resources Board identifies several transport couplings for the San Joaquin Valley air basin (**see AIR QUALITY Table 3**). These couplings come in three qualitative varieties, Overwhelming, Significant and Inconsequential. Overwhelming couplings indicate that emissions from the upwind area caused a violation of the state 1-hour ozone standard (0.09 ppm) on at least one day independently of any emission sources within the downwind area. Significant couplings indicate that emissions from the upwind area contribute, but not overwhelmingly, to a violation of the state 1-hour ozone standard. Inconsequential couplings indicate that emissions from the upwind area were not transported or did not contribute significantly to a violation of the state 1-hour ozone standard.

AIR QUALITY Table 3
Transport Couples for the San Joaquin Valley Air Basin

Transport Couple	Characterization
San Joaquin Valley to Mountain Counties	O
San Joaquin Valley to South Central Coast	S, I
San Joaquin Valley to Mojave Desert	O, I
San Joaquin Valley to Sacramento Area	S, I
San Joaquin Valley to Great Basin Valleys	O
San Joaquin Valley to North Central Coast	S
Sacramento Area to San Joaquin Valley	S, I
San Francisco Bay Area to San Joaquin Valley	O, S, I
O – Overwhelming S – Significant I – Inconsequential	

In the case of the San Joaquin Valley air basin, there are several downwind areas. In 1993 the CARB concluded that the southern potion of the Mountain Counties air basin (those counties south of the Amador- El Dorado county boarder) was overwhelmingly impacted by transported ozone and ozone precursors from the San Joaquin Valley on some days and both the San Joaquin Valley and the San Francisco Bay Area on others. This decision was re-enforced in 1996, when CARB found that 49 exceedances occurring in Mariposa and Tuolumne Counties were due to overwhelming transport from the San Joaquin Valley.

In 1993, CARB classified San Joaquin Valley contributions to ozone violations in San Luis Obispo County (northern portion of South Central Coast) as significant on some days and inconsequential on others. However, CARB also determined that there were several complicating factors regarding the transport issues within the South Central Coast. The contributions from the California Coastal Waters (consisting of oil platforms and San Miguel, Santa Rosa and Santa Cruz Islands) are also considered significant on some days, although not in San Luis Obispo. Additionally there is a possibility that ozone transported within the inversion layer was tapped and may have been responsible for some of the ozone violations across the South Central Coast. In the November 1996, Second Triennial Review, CARB concludes that nine 1-hour ozone violations in Santa Barbara County (southern portion of the South Central Coast) from 1994 to 1996 seemed to be related to transport from outside of the county. CARB classified the nine violation days in Santa Barbara County as shared transport days. Furthermore, CARB identified the same ozone reservoir as a possible source for ozone and ozone precursors for San Luis Obispo County.

In May 1996, CARB split the Southeast Desert air basin into the Mojave Desert and Salton Sea air basins. CARB determined that the San Joaquin Valley air basin contributions to violations of the state 1-hour ozone standard in the Mojave Desert air basin where overwhelming on some days and inconsequential on others.

In 1990 CARB determined that the northern portion of San Joaquin Valley contributed to at least one day of ozone violations in the Sacramento Area.

Therefore, CARB classifies the San Joaquin Valley contribution as overwhelming on some days and inconsequential on others.

In 1996, CARB confirmed an earlier finding that the San Joaquin Valley was an overwhelming contributor to exceedances of the ozone standard within the Great Basin Valleys. CARB determined that all the exceedances measured at the Mammoth Lakes monitoring station (the only exceedances within the Great Basin Valley) were due to overwhelming transport of ozone and ozone precursors from the San Joaquin Valley. Furthermore, CARB determined that emission sources within the Great Basin Valley contributed very little or not at all to these exceedances.

In 1996, CARB determined that the San Joaquin Valley was a significant contributor to ozone violations in the North Central Coast. However, CARB also determined that the San Francisco Bay Area contributed overwhelmingly and significantly to most of the violations due to transport in the North Central Coast. CARB was not able to separate the combined impacts from both San Joaquin Valley and the San Francisco Bay Area on those days when they occurred.

In 1990, CARB found that the Sacramento Area significantly contributed to ozone violations in the northern portion of the San Joaquin Valley. Therefore, CARB classifies this transport link as significant on some days and insignificant on others.

In 1996, CARB confirmed their 1993 finding that the San Francisco Bay Area was the overwhelming cause of some ozone violations in the northern portion of the San Joaquin Valley. These violations occurred in Tracy and Crows Landing and are attributed solely to transport from the San Francisco Bay Area.

For mitigation purposes, CARB requires two things of upwind air basins, a commitment to adopt best available retrofit control technologies for NOx and VOC emission sources and, for overwhelming transport, the inclusion of measures in the air quality plans to ensure expeditious attainment of the state 1-hour ozone standard in the downwind areas.

From 1997 to 1999, the District demonstrated that they reduce NOx emissions by 176.81 tons per day and VOC emissions by 49.74 tons per day (APCD 2000e). This was accomplished through the implementation of 11 new rules at the District. The District continues to implement new rules that will further control sources within their authority (23 new rules are pending). The San Joaquin Valley Air Quality Management Plan (AQMP) addresses attainment of the ***federal*** (not state) 1-hour ozone standard by the year 2010. However, the AQMP will have a positive and significant effect on the number and severity of violations of the 1-hour state ozone standard in downwind areas. Therefore, staff finds that the AQMP and the demonstrated rate of progress by the District is well within the intent of the proposed CARB mitigation for upwind air basins.

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 ammonia 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. The La Paloma Power Project 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. The District, CARB, EPA and the Energy Commission Staff agree on the following conclusions about the NOx/PM10 relationship:

- NOx emissions contribute significantly to the formation of particulate nitrate in the region where the Western MSCC site is located, and
- ammonium nitrate is the largest contributor to PM10 levels during the winter when ambient PM10 levels are at there highest.

Staff's assessment of the NOx contribution to particulate nitrate formation (ARB 1993-1997) (Chow et al. 1993) corroborates the 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 Western MSCC project will include a power plant, and the following ancillary facilities as well:

- a 1.8 mile long, 16-inch diameter water supply line along existing right of ways from the existing West Kern Water District pumping station to the project site,
- a single circuit 230 kV transmission line approximately 19 miles along existing right of ways from the project site to the PG&E Midway substation (near Buttonwillow).

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 20-month construction activity are shown in **AIR QUALITY Table 4**. The emissions for the linear facilities are aggregated in **AIR QUALITY Table 4**, and may not represent all the linear facilities previously identified. Staff is currently pursuing clarification on this matter. These peak emissions will not occur over the entire construction period of the project, however it is likely that the peak emissions for the project site will coincide with the peak emissions of the linear facilities.

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

	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Project Site [a]	285.2	41.6	266.1	28.3	31.2	396.0[c]
All Linear Facilities [b]	216.0	20.8	68.8	20.0	19.2	4.0[d]
Total	501.2	62.4	334.9	48.3	50.4	400.0

Notes: All activities based on an 8 hour workday, 20 days per month.

[a] Includes the combustion turbines, cooling towers, associate buildings and services, and employee vehicle emissions.

[b] Includes the water supply pipeline, waste water pipeline and 230 kV transmission line.

[c] Assuming the disturbed earth is 11 acres and 1.2 ton PM/month/acre, 60% of which is PM10, 50% of which will be controlled by watering.

[d] Assuming the total disturbed earth is 0.11 acres for all linear facilities and 1.2 ton PM/month/acre, 60% of which is PM10, 50% of which will be controlled by watering.

(Midway 1999a)

PROJECT SITE

This construction will include the combustion turbines, the cooling towers and all other associated services (such as pumps, valves, pressure vessels and buildings). The emissions in **AIR QUALITY Table 4** for the project site also include the vehicle emissions of the construction employees.

The power plant itself will take approximately 20 months to construct. The power plant project construction consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest 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. This 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. The maximum fugitive dust emissions are expected to occur during the first three months of construction. During this time MSCC estimates that they will be disturbing approximately 11 acres of earth (an average of 3.7 acres per month). MSCC assumed that 1.2 tons of fugitive dust is generated for each acre of earth disturbed per month (EPA 1995a, Section 13.2.3.3), that 60% of that dust is PM10 and that 50% of that PM10 is controlled through watering the construction site. From these assumptions, the estimated maximum expected PM10 emission from fugitive dust at the project site would be 396 lbs/day over a 3-month period.

LINEAR FACILITIES

The linear facilities include the wastewater pipeline, the water pipeline and the 230 kV transmission line. However, MSCC aggregated the construction emissions associated with the linear facilities into one set of emission values. Therefore staff has no way of determining if these emission estimates are complete. It is staff's opinion that these emission estimates are close to complete (if not complete) and that no further clarification needs to be provided. MSCC proposes to perform the construction of all linear facilities along existing right of ways. These right of ways have maintenance roads already in place, therefore construction related emissions for the linear facilities are expected to be minimal.

OPERATIONAL PHASE

EQUIPMENT DESCRIPTION

- The major components of the Western MSCC project consist of the following: two combustion turbine generators (CTG), using either the General Electric Frame 7F or the Westinghouse 501F, both nominally rated at approximately 170 MW. Each of the CTGs would be equipped with evaporative inlet air coolers;
- Two natural gas fired heat recovery steam generators (HRSG) and ancillary equipment;
- One steam turbine, rated at 170 MW;
- One seven-cell cooling tower;
- One diesel fuel fired water pump;

EQUIPMENT OPERATION

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

The Western MSCC project will have several different operating modes to respond to the changing power market; start-up, shutdown, base load (with and without duct firing) and turndown (or part load). MSCC is requesting that the project be analyzed considering two possible general operating scenarios. Operating scenario one would assume that the facility would be operated as a baseload unit. MSCC assumes that the facility will be 95% dispatchable and would need 15 startups (coupled with15 shutdowns) per year per turbine. Operating scenario two would assume that the facility would be operated as a peaking or load-following unit. MSCC assumes that the facility would be 80% dispatchable and would have no more than 150 startups (coupled with 150 shutdowns) per year per turbine.

There are several different start-ups for a gas turbine, 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 (i.e., producing baseload electrical power). A hot start would occur after an overnight turbine shutdown, typically eight-hours in length. The duration of a hot start is relatively short, approximately 90 minutes. A warm start-up typically follows a two-day shut down and is approximately 150 minutes in duration to allow the steam turbine to be ramped up. A cold start takes considerably longer, on the order of four hours and typically follows a three-day or longer shutdown. 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. MSCC has defined startup periods for the cold starts as lasting no more than four-hours each, the warm starts no more than 2½ hours and the hot starts no more than 1½ hours.

MSCC is requesting that the number of startups per year per turbine for each operating scenario be broken down as follows. Scenario One having 15 startups per year per turbine, 2 are cold starts, 10 are warm starts and 3 are hot starts. Scenario Two having 150 startups per year per turbine, 10 are cold starts, 130 are warm starts and 10 are hot starts.

The diesel-fired emergency firewater pump would be tested once a month.

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 CTG is equipped with the latest dry low-NOx combustor design developed by GE. 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 natural gas fired heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NOx, CO and VOC emissions. MSCC is proposing to use a Selective Catalytic Reduction (SCR) system to reduce NOx emissions. An oxidizing catalyst, will also be installed in the HRSG to reduce CO and VOC emissions. A more complete discussion of these catalyst technologies is included in the Mitigation section.

PROJECT OPERATING EMISSIONS

Startup emissions are difficult to estimate for any post-combustion controlled gas turbine. This is due to several problems, first and foremost, startup is a volatile unsteady action. Fuel and air ratios and injection rates are changing throughout the process, as well as exhaust temperatures and flow rates. Secondly, the post-combustion controls are temperature dependent. The SCR and oxidizing catalyst do not become effective until the exhaust gases reach approximately 500 ^{o}F, which is 20 minutes after the turbine starts up. The applicant's estimates for startup emissions as shown in **AIR QUALITY Table 5.**

AIR QUALITY Table 5
Project Startup Emissions Estimates[a]
(lbs/event)

	Duration (minutes)	NOx	SOx	PM10	VOC	CO
Westinghouse 501F						
Cold Start	240	700	8.4	53.2	400	3,650
Warm Start	150	350	5.3	33.3	150	2,230
Hot Start	90	240	3.2	20	90	1,940
General Electric Frame 7FA						
Cold Start	180	1000	12.6	108	800	1600
Warm Start	60	340	4.2	36	280	720
Hot Start	30	100	2.2	18	170	350

(Midway 1999a, Appendix O-12)
[a] All emissions include both gas turbines.

Western MSCC projects criteria for air pollutant emissions during short periods of time, one hour or less are shown in **AIR QUALITY Table 6**. Comparing **Tables 5 and 6** shows that the highest emissions are from the combustion turbine during startup for NOx, CO and VOC. However, the emissions for PM10 and SOx are fuel based emissions estimates (i.e., they are based on the amount of fuel burned), therefore these emissions are higher when the turbines are at full load.

AIR QUALITY Table 6
Project Hourly Emissions
(lbs/hr)

Operational Profile	NOx	SO2	PM10	VOC	CO
Westinghouse 501F (19°F, baseload)[a]	17.7	3.9	9.0	3.6	25.9
General Electric Frame 7FA (19°F, baseload)[a]	16.7	3.67	9.0	2.8	23.7
Duct burners[a]	044	0.09	0.44	0.60	4.35
Cooling Towers[a]	--	--	0.34	--	--
Emergency Fire-water Pump[a]	6.9	0.14	0.12	0.2	1.6
2 CTGs at peak load + duct firing + Cooling Tower + Emergency Firewater Pump					
Westinghouse 501F	36.28	7.98	19.56	8.40	60.50
General Electric Frame 7FA	34.28	7.52	19.56	6.80	47.30

(Midway 2000q)
[a] Per emission unit

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 start-up, steady state operation with the natural gas fired duct and the operation of the cooling tower.

AIR QUALITY Table 7
Gas Turbine Daily Emissions
(lbs/day)

Operational Profile	NOx	SO2	PM10	VOC	CO
Westinghouse 501F					
Cold Start + 20 hrs of Full Load Operation	1,432.54	182.20	444.52	568.17	4,861.64
Warm Start + 21.5 hrs of Full Load Operation	1,136.96	191.07	453.96	440.77	3,532.39
Hot Start + 22.5 hrs of Full Load Operation	1,063.24	196.95	460.22	429.17	3,302.89
24 hrs of Full Load Operation	877.66	205.72	469.56	201.77	1,453.64
General Electric Frame 7FA					
Cold Start + 21 hrs of Full Load Operation	1,726.82	184.72	518.88	942.97	2,594.94
Warm Start + 23 hrs of Full Load Operation	1,135.38	191.36	486.00	436.57	1,809.54
Hot Start + 23.5 hrs of Full Load Operation	912.52	193.12	477.78	329.97	1,463.19
24 hrs of Full Load Operation	829.66	194.68	469.56	136.37	1,136.84

All instances of full load operation include the cooling tower, duct firing and 1-hour operation of the emergency IC engine.

The annual emissions for the Western MSCC project are summarized in the **AIR QUALITY Tables 8, 9 & 10**. These tables show both general operating scenarios being proposed for the Western MSCC project. The annual emissions include 200 hours of operation from the IC diesel emergency engine and 1200 hours of operation from the duct burners. Tables 8 & 9 show the planned down time for the facility under each operating scenario.

AIR QUALITY Table 8
Project Annual Emissions Scenario 1
(tons per year [ton/yr])

		NOx	SOx	PM10	VOC	CO
Westinghouse 501F						
Cold Starts	2 /yr	0.7	0.01	0.05	0.40	3.65
Warm Starts	10 /yr	1.75	0.03	0.17	1.30	11.15
Hot Starts	3 /yr	0.36	0.00	0.03	0.36	2.91
Duct burner	1200 hrs/yr	0.53	0.11	0.53	0.72	5.22
Full Load	8322 hrs/yr	137.31	30.38	76.31	27.46	201.81
IC Engine	200 hrs/yr	0.69	0.01	0.01	0.02	0.16
Total	8359.5 hrs/yr	141.34	31.94	77.10	30.26	224.90
Down time	400.5 hrs/yr	Or 16.7 days				
General Electric Frame 7FA						
Cold Starts	2 /yr	1.00	0.01	0.03	0.80	1.60
Warm Starts	10 /yr	1.70	0.02	0.18	1.40	3.60
Hot Starts	3 /yr	0.15	0.00	0.11	0.26	0.53
Duct burner	1200 hrs/yr	0.53	0.11	0.53	0.72	5.22
Full Load	8322 hrs/yr	129.82	30.38	76.31	21.64	149.80
IC Engine	200 hrs/yr	0.69	0.01	0.01	0.02	0.16
Total	8339.5 hrs/yr	133.89	31.94	77.17	24.83	160.91
Down time	420.5 hrs/yr	Or 17.5 days				

Full load includes the operation of the cooling tower.

AIR QUALITY Table 9
Project Annual Emissions Scenario 2
(tons per year [ton/yr])

		NOx	SOx	PM10	VOC	CO
Westinghouse 501F						
Cold Starts	10 /yr	3.50	0.04	0.27	2.00	18.25
Warm Starts	130 /yr	22.75	0.34	2.16	16.90	144.95
Hot Starts	10 /yr	1.20	0.02	0.10	1.20	9.70
Duct burner	1200 hrs/yr	0.53	0.11	0.53	0.72	5.22
Full Load	7008 hrs/yr	115.63	25.58	64.26	23.13	169.94
IC Engine	200 hrs/yr	0.69	0.01	0.01	0.02	0.16
Total	7388 hrs/yr	144.30	27.51	67.33	43.96	348.23
Down time	1372 hrs/yr	Or 57.2 days				
General Electric Frame 7FA						
Cold Starts	10 /yr	5.00	0.06	0.54	4.00	8.00
Warm Starts	130 /yr	22.10	0.27	2.34	18.20	46.80
Hot Starts	10 /yr	0.50	0.01	0.09	0.85	1.75
Duct burner	1200 hrs/yr	0.53	0.11	0.53	0.72	5.22
Full Load	7008 hrs/yr	109.32	25.58	64.26	18.22	126.14
IC Engine	200 hrs/yr	0.69	0.01	0.01	0.02	0.16
Total	7173 hrs/yr	138.15	27.45	67.77	42.01	188.08
Down time	1587 hrs/yr	Or 66.2 days				

Full load includes duct firing and the operation of the cooling tower.

For comparison, staff has presented the highest emissions from each scenario for each pollutant to that of both turbines operating non-stop throughout the year. The highest annual emissions of SO2 would occur with this scenario, since these emissions are a function of the quantity of fuel burned. The annual emissions of NOx would normally be higher with the inclusion of the start-up emissions, however in this case the applicant is taking into consideration the down time of the turbine. Therefore, the highest NOx emissions occur if the facility runs for the entire year. The PM10 emissions are normally identical in both cases because the standard assumption is that PM10 emissions during start-up are the same as those during normal operation. However, in this case PM10 is higher for the facility running the entire year because the applicant is accounting the facility down time. VOC is a fuel based emission (i.e., the more fuel burned the more emissions created) so normally the maximum VOC emission is a result of the facility running the entire year. However, in this case the applicant is assuming that the oxidation catalyst will not be effective during the startup process. This is a very conservative assumption and artificially inflates the expected VOC emissions during startup so that they appear higher than if the facility operated year round. CO emissions are typically higher when startups are considered, and even though the applicant is considering down time for the facility, they are still higher for the proposed operating scenarios.

AIR QUALITY Table 10
Project Annual Emissions
(tons per year [ton/yr])

	Westinghouse 501F		General Electric Frame 7FA		
	Worst Case	Full Load Year Round	Worst Case	Full Load Year Round	Proposed Operating Scenario
Nox	144.30	**145.76**	**138.15**	137.88	2
Sox	31.94	**33.50**	31.94	**33.50**	1
PM10	77.10	**80.87**	77.17	**80.87**	1
VOC	**43.96**	29.64	**42.01**	23.51	2
CO	**348.23**	217.81	**188.08**	163.06	2

Full Load Year Round includes 2 turbines, duct firing, cooling tower and 200 hours of IC diesel engine operation.

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. MSCC has committed to an ammonia slip no greater than 10 ppm. Recent siting cases in the South Coast Air Quality Management District have restricted ammonia slip emissions for similar sized turbines to 5 ppm, which is also the CARB recommended ammonia slip level. On a daily basis, the ammonia slip of 10 ppm is equivalent to approximately 583 lb./day of ammonia emitted into the atmosphere per turbine.

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 one to two ppm, corresponding to a mass emissions in the Western MSCC case to approximately 50 to 125 pounds per day per turbine. The implications of these ammonia emissions are discussed later in this analysis.

FACILITY CLOSURE

Eventually the Western MSCC project 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 will 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 MSCC decides 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 will include the specific details regarding how MSCC plans to demonstrate compliance will 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 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

MSCC performed air dispersion modeling analyses of the potential construction impacts at the project site. The analyses included fugitive dust generated from the construction activity and combustion emissions from the equipment. 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 during the 11th month of the 20-month construction period.

Most of the construction emissions associated with combustion sources will occur from the 1st through 15th month. On average, the estimated hourly emissions for these months will be approximately 82% of the 11th month peak. Additionally, the estimated hourly emission rates assume that all equipment slated to operate that month operate each day of the month, which is not the case. This assumption is made so that the worst possible impact can be determined, however, actual impacts are very likely to be far less than the modeled impacts.

The results of this modeling effort are shown in **AIR QUALITY Table 11**. They show that the construction activities would cause a violation of the state 1-hour

average NO2 standard and further exacerbate existing violations of the state 24-hour average PM10 standard. 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.

AIR QUALITY Table 11
Maximum Construction Impacts

Pollutant	Averaging Time	Impact (mg/m^3)	Background (mg/m^3)	Total Impact (mg/m^3)	Limiting Standard (mg/m^3)	Percent of Standard
NO2	**1-hour**	632	97	729	470	**155**
	Annual	57	16.6	74	100	74
CO	1-hour	1698	2941	4639	23,000	20
	8-hour	463	2222	2685	10,000	27
SO2	1-hour	370	104	474	655	72
	3-hour	191	53	244	1,300	19
	24-hour	27.7	17	44.7	130	34
	Annual	7.6	1.8	9.4	80	12
PM10	**24-hour**	55.8	109	164.8	50	**330**
	Annual	20.3	31.7	52	30	**173**

(Midway 2000o)

Although construction of the Western MSCC project 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 more 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 12** shows the modeled fumigation results and impacts on the one-hour NO2, CO and SO2 standards. Since fumigation impacts will not typically occur much beyond a one-hour period, only impacts on these one-hour standards were addressed. The results of the modeling analysis show that fumigation impacts at either partial load (50 percent) or full load will not violate the NO2, CO or SO2 one-hour standards.

AIR QUALITY Table 12
CTG Fumigation Modeling Maximum 1-Hour Impacts

Pollutant	Impact (mg/m^3)	Background (mg/m^3)	Total Impact (mg/m^3)	Limiting Standard (mg/m^3)	Percent of Standard
NO2	8.07	97	105.1	470	22
CO	53.98	2941	2995	23,000	13
SO2	1.16	104	105	655	16
Notes: Impacts reflect the highest results, turbine at 50% load, 63.9°F, no duct burners , winds at 1 m/s.					

(Midway 1999a)

OPERATIONAL MODELING ANALYSIS

MSCC provided staff with a modeling analysis, using the ISCST3 model to quantify the potential impacts of the project for both turbines, during normal steady state operation and during start-up conditions. This modeling analysis consisted of a screening-level and a refined-level analysis. The screening-level analysis tested 12 basic operating conditions, which combined various load levels and duct burner operations with several ambient air temperatures. The refined analysis involved only NOx and PM10 modeling for normal operations for the turbine set that would cause the highest emission impact. The results of these modeling analysis are shown in **AIR QUALITY Table 13**. This table shows that during normal operation of the combustion turbines, the air pollution impacts would not cause a violation of any NO2, CO or SO2 ambient air quality standards.

The project's PM10 impacts could contribute to existing violations of the state 24-hour and annual average PM10 standards. 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. 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 13**. However, if left unmitigated, staff would consider the PM10 impacts significant.

AIR QUALITY Table 13
Combustion Turbine Modeling Maximum Impacts

Pollutant	Operation	Averaging Time	Impact (mg/m^3)	Back-Ground (mg/m^3)	Total Impact (mg/m^3)	Limiting Standard (mg/m^3)	Percent of Standard
NO2	1,A	1-hour	59.9	97	156.9	470	33
	1,A	Annual	0.5	16.6		100	17
CO	1	1-hour	483	2,941	3,424	23,000	15
	1	8-hour	181	2,222	2,403	10,000	24
SO2	2	1-hour	13.7	104	117.7	655	18
	2	3-hour	9.1	53	62.1	1300	5
	2	24-hour	2.0	17	19	130	15
	2	Annual	0.07	1.8	1.9	80	2
PM10	1, A, B	**24-hour**	9.2	118	127.2	50	**254**
	1, A, B	**Annual**	3.4	39.8	43.2	30	**144**

1 Emissions modeled reflect the Westinghouse 501F Turbines operating in winter (19°F) at part load (50%) with the duct burners off.

2 Emissions modeled reflect the General Electric Frame 7FA Turbines operating in winter (19°F) at full load (100%) with the duct burners off.

A Indicates refined modeling of the project emissions.

B PM10 emissions include emissions from the operation of the proposed cooling towers at full load.

(Midway 2000o)

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 one-hour impacts, MSCC assumed that one turbine would be in start-up and one turbine would be running under full load. NOx and CO controls were assumed to be inactive during startup. The modeling results, shown in **AIR QUALITY Table 14**, indicate that the highest short-term impacts on ambient NO2 and CO levels do occur during start-up circumstances.

The modeling analysis 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.

AIR QUALITY Table 14
Combustion Turbine Startup Modeling Impacts

Pollutant	Operation	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	1	1-hour	222.7	97	319.7	470	68
CO	1	1-hour	3,246	2,941	2941	23,000	27
	1	8-hour	1,191	2,222	3413	10,000	34

1 Emissions modeled reflect the Westinghouse 501F Turbines during a warm startup, as indicated in AIR QUALITY Table 5.

(Midway 2000o)

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 Western MSCC project do have the potential (if left unmitigated) to contribute to higher ozone levels in the region.

Concerning secondary PM10 (primarily ammonium nitrate) formation, the La Paloma Generation Plant (LPGP 1999a) submitted a conclusion from a study by Sonoma Technology, Inc. which 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 Western MSCC project, MSCC quantified the highest ammonia emissions at approximately 583 pounds per day per turbine based on a permitted 10-ppm ammonia slip. However, staff believes that these mass emissions will be more on the order of 50 to 125 pounds per day per turbine based on a normal 1 to 2 ppm ammonia slip. Therefore, it is staff's opinion that the ammonia slip emission do not have the potential to cause or contribute to an exceedance of the PM10 standard.

The SOx and NOx emissions from the Western MSCC project could add to secondary PM10 formation, since there is more than sufficient ambient ammonia available to react and form ammonium sulfate and ammonium nitrate. Therefore, if the SOx and NOx emissions are left unmitigated they may have the potential to contribute to PM10 exceedances.

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, staff believes this issue needs to be addressed.

Staff, as part of their cumulative modeling analysis quantified, 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: Western MSCC, Sunrise Cogeneration and the recently licensed La Paloma project. Staff believes that the emissions of NOx from Western MSCC project does have the potential (if left unmitigated) to contribute, to higher secondary PM10 (particularly of ammonium nitrate) levels in the region.

CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future projects as part of a cumulative impacts analysis, staff needs specific and timely 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 (February 2000), there were three other projects that required a District permit, two of which are within a six mile radius of the project site. They are the Elk Hills Power Project that filed a AFC with the Energy Commission in February 1999, the Sunrise Cogeneration and Power Project that filed an AFC with the Energy Commission in December 1998 and the La Paloma Generation Project that filed an AFC in July 1998.and received their license in October, 1999. MSCC has performed, at staff's request, a cumulative modeling assessment of the four projects, MSCC, Elk Hills, Sunrise and La Paloma.

Details of the cumulative analysis are contained within the MSCC response to staff data request dated May 5, 2000. MSCC modeled all four power plants in various modes of operation, including both the Westinghouse and General Electric Turbine

options. La Paloma was modeled as if it were in augmented power mode, in addition to the La Paloma auxiliary boiler being at full load. Sunrise was modeled in baseload mode, while Elk Hills and Western MSCC power plant were modeled in startup mode. The results of this modeling analysis are shown in **AIR QUALITY Table 15**.

AIR QUALITY Table 15
Maximum Cumulative Impacts

Pollutant	Averaging Time	Impact (mg/m^3)	Background (mg/m^3)	Total Impact (mg/m^3)	Limiting Standard (mg/m^3)	Percent of Standard
NO2	**1-hour**	386.1	94	480	470	**102**
	Annual	2.75	16.6	19.4	100	19
CO	1-hour	1833	2941	4774	23,000	21
	8-hour	657	2222	2879	10,000	29
SO2	24-hour	1.51	20	21.5	130	17
	Annual	0.20	1.8	2.0	80	3
PM10	**24-hour**	4.77	118	122.8	50	**246**
	Annual	0.87	31.7	32.6	30	**109**

(Midway 2000o)

As **AIR QUAITY Table 15** shows, the cumulative air quality effects of the four projects do not cause a new violation of any CO or SO2 ambient air quality standards. The four projects would contribute to already existing violations of the state PM10 ambient air quality standards. However, all three of these projects will be required to provide PM10 emission offsets to mitigate their PM10 impacts. The four project could also cause violations of the 1-hour NO2 standard, however the impact indicated in Table 15 does not consider potential ozone limiting effects. MSCC reports that if these effects are taken into consideration, the resulting impacts will be 84% of the limiting ambient air quality standard. However, there is insufficient information at this time to determine if the ozone limiting effect have been taken into consideration correctly for one or all of the power plant being considered. Therefore, at this time it is staff's opinion that the cumulative analysis should reflect no ozone limiting. Additionally, it is staff's opinion that the Western MSCC NOx emissions have the potential to cumulative contribute to an exceedance of the NO2 standard if left unmitigated.

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 Western MSCC project are the Domeland Wilderness Area 90 miles to the northeast and the San Rafael Wilderness Area 35 miles to the south. MSCC 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. 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, MSCC will employ appropriate fugitive dust mitigation measures to limit their construction related PM10 emissions. At this time MSCC is proposing to use watering techniques approved by the District. These techniques are assumed to reduce the fugitive PM10 emissions by 50%.

OPERATIONS MITIGATION

The Western MSCC project'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, The Western MSCC project proposes to use dry-low NOx combustors in the CTGs. In addition, an ammonia injection grid will be used in conjunction with a Selective Catalytic Reduction system.

To reduce CO and VOC emissions, MSCC proposes to use a combination of suitable 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 Low-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 GE version of the dry low-NOx combustor is a four-stage ignition system. Initially the fuel/air mixture is ignited in two independent combustors (0% to 35% load). Then the startup sequence moves to a lean-lean operation (35% to

70% load) where the center burner is engaged as well. Then second stage burning is begun and all the fuel is directed to the center burner. The second stage burning is a transient event while proceeding to the premixed phase. Premixed operation (70% and 100% load) has fuel being pumped to all burners, but ignition only in the center burner.

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. The Western MSCC project is proposing two catalyst systems, a selective catalytic reduction system to reduce NOx, and an oxidizing system to reduce CO.

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°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.

MSCC proposes to use a combination of the dry low-NO_x combustors and SCR system to produce a 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, MSCC 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 6 ppm, corrected to 15 percent excess oxygen and averaged over 24 hours.

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. MSCC project 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 MSCC provide emission offsets, in the form of banked Emission Reduction Credits (ERC), for the project's emissions increases of NOx, SO2, VOC and PM10. MSCC has secured a number of offsets through option agreements. 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.

MSCC proposed interpollutant trading for their PM10 liability (i.e., trading of NOx for PM10). The ratio of 2.22 pounds of NOx for every one pound of PM10 was determined by the District as the appropriate interpollutant trading ratio. The District rules allow for such inter-pollutant trading (Rule 4.2.5.3). 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. **AIR QUALITY Table 12** shows the balance of expected project emissions to emission reduction credits provided.

AIR QUALITY Table 16
Emissions Offsets Balance

	Offsets Required	Offsets provided (adjusted for distance)	Balance	NOx offsets provided for PM10	Final Balance
	Tons/year				
Westinghouse 501F					
PM10	75.76	0.00	75.76	77.24	-1.47
NOx	143.61	315.08	-171.47		
SO2	30.20	30.20	0.00		
VOC	43.95	43.950	0.00		
General Electric Frame 7FA					
PM10	75.58	0.00	75.58	77.06	-1.47
NOx	137.45	308.52	-171.07		
SO2	30.55	30.55	0.00		
VOC	41.99	41.99	0.00		
Refer to AIR QUALITY Tables 7, 8, 9 and 10 (APCD 2000f)					

ADEQUACY OF PROPOSED MITIGATION

CONSTRUCTION MITIGATION

MSCC is required to comply with the District Regulation 8 for limiting fugitive dust emissions during construction. Staff believes that additional measures are necessary to mitigate potential construction impacts (refer to staff proposed mitigation below).

OPERATIONS MITIGATION

EMISSION CONTROLS

MSCC has proposed, in their opinion, all practical and technically feasible mitigation measures to limit NOx emissions from the combustion turbines to 2.5 ppm over a one-hour average. In addition, they propose to use an oxidizing catalyst to limit CO emissions to 6-ppm over a three-hour period, which will also limit VOC emissions to 1.4 ppm over a 24-hour period.

MSCC 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.

OFFSETS

The applicant is proposing to reduce emissions at their existing facility which adjoins the proposed project site location (Midway-Sunset Cogeneration & Power Project). The applicant has reduced NOx emissions at the existing Midway-Sunset

Cogeneration facility by installing new Dry Low NOx combustors. This will result in a total emission reduction of approximately 450 tons of NO_2 per year and 411 tons per year of CO (assuming 80% dispatch) for the existing facility. The District banking rules reduce the amount of emissions that can be applied to ERCs, leaving approximately 258.9 tons for mitigation purposes. The remaining NOx ERCs shown in **AIR QUALITY Table 12** are made up of three ERC purchases. SOx and VOC are mitigated through ERC purchases as well. Staff finds that these ERCs and emission reductions mitigate the project operational impacts.

Ozone and Ozone Precursor Transport to San Luis Obispo

CARB determined that emissions sources within the San Joaquin Valley contribute significantly to some ozone exceedances in the San Luis Obispo County area (see Environmental Setting Section). Therefore, new project emissions (construction) and operation) have the potential to exacerbate this situation if left unmitigated. In this case the existing Cogeneration facility will be lowering NOx emissions by 411 tons per year permanently and contemporaneously with the proposed expansion project. This is well in excess of the 144 tons of NOx per year that the new expansion project will emit. That is a NOx reduction of approximately 267 ton/year or 1,463 lbs/day.

The San Luis Obispo Air Pollution Control District (SLO) recently received $150,000 from the Elk Hill Power Project to be used in a new emission reduction campaign in San Luis Obispo County (primarily near the Paso Robles area). The Elk Hills Power Project NOx emissions are very similar to the proposed Western Midway-Sunset expansion emissions (approximately 147 tons per year). It is SLO's intent to use these funds to replace existing agricultural internal combustion diesel powered engines with cleaner burning technologies. These cleaner technologies can consist of electric equipment or equipment that burns cleaner fuels such as natural gas, liquid petroleum gas or clean diesel (less than 15 ppm sulfur content). SLO estimates that they have the potential to eliminate up to 55 tons of NOx per year with this money and an $83,000 grant from CARB's Carl Moyer fund.

SLO seems to be requiring NOx reductions to address their concerns regarding ozone violations due to the transportation of ozone and ozone precursors (NOx and VOC) from the San Joaquin Valley, although this is not part of any rule requirement in either San Joaquin Valley or San Luis Obispo APCDs. This is also above and beyond what CARB is currently requiring for mitigation from the transportation of ozone and ozone precursors (see Environmental Setting Section) for upwind districts. SLO seems satisfied that 55 tons of NOx per year, for projects similar in size to Western MSCC, sufficiently addresses their concerns regarding the transport of ozone and ozone precursors. The Western MSCC is providing nearly 5 times (267/55) the NOx emission reduction that SLO believes is possible with their Stationary Agricultural Engine Incentive Program currently being funded (in part) by the Elk Hills Power Project. Therefore, it is staff's opinion that the concerns raised by SLO regarding ozone transportation impacts in Paso Robles connected with the Western MSCC project emissions are adequately addressed.

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. MSCC stated in their AFC that they intend to use watering as their main control mechanism for fugitive PM10.

The modeling assessment discussed earlier shows that the combustion sources used for heavy construction have the potential for causing significant air quality impacts. After responding to a staff data request directing MSCC to investigate 11 different mitigation options, MSCC has determined that the following options are reasonable mitigation measures.

MSCC will employ timing retardation on older diesel construction equipment that does not use a fuel injection system (referred to as a common rail). MSCC will employ were possible construction equipment that uses the common rail, high-pressure fuel injection system. MSCC will ensure that all on-road gas powered vehicles are equipped with a catalytic converter. MSCC will ensure that idle time on all diesel power construction equipment is minimized to less than 5 minutes. MSCC further agrees to employ oxidizing soot filters and oxidation catalysts where applicable.

To ensure that these measures are followed, staff proposes Conditions of Certification in Air Quality AQ-C1 and AQ-C2.

OPERATIONS MITIGATION

Staff finds that the mitigation provided for the proposed Western MSCC fully mitigates the project air quality impacts.

COMPLIANCE WITH LORS

FEDERAL

The USEPA has not yet issued a preliminary Prevention of Significant Deterioration (PSD) permit for the Western MSCC project.

STATE

MSCC will demonstrate that the Western MSCC project complies with Section 41700 of the California State Health and Safety Code by the District's issuance of a Final Determination of Compliance and the CEC staff's affirmative finding for the project.

LOCAL

Compliance with specific SJVUAPCD rules and regulations are discussed below. For a more detailed discussion of the compliance of the Western MSCC, please refer to the Preliminary Determination of Compliance (APCD 2000f).

RULE 2201 - NEW AND MODIFIED STATIONARY SOURCE REVIEW RULE

SECTION 4.1 - BEST AVAILABLE CONTROL TECHNOLOGY

The SJVUAPCD has determined the Best Available Control Technology for the emission generating equipment and is summarized in the following **AIR QUALITY Table 17**.

AIR QUALITY Table 17
BACT Determinations

Pollutant	Gas Turbine Engines
PM10	Air inlet filters, lube oil vent coalescer and opacity <5%, natural gas fuel
SO_2	Utility quality natural gas
NO_x	2.5 ppm @ 15% O_2, 1-hr average
VOC	1.4 ppm @ 15% O_2 3-hr average
CO	6 ppm @ 15% O_2 3-hr average

SECTION 4.2 - OFFSETS

Western MSCC demonstrated through air dispersion modeling that their project would not cause a violation of any CO ambient air quality standard, therefore, CO emission offsets are not required for the combustion turbine CO emissions. All other project emissions are subject to emissions offsets, which are discussed in the Mitigation section of this analysis, and in the DOC. These are both the basis for determining the appropriate offsets that will be required for the project, as well as the basis for the daily and annual emission limits.

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. Because the project demonstrates that it does not cause a violation of any CO ambient air quality standard, and that the project is fully offset for its other emissions, the District has determined that the Western MSCC will not make the ambient air quality worse.

Rule 2520 – Federally Mandated Operating Permits

Western MSCC is required to file a Title V Operating permit with the District within 12 months of commencing operation. Presently, no action is required.

Rule 2540 – Acid Rain Program

An acid rain application must be submitted at least 24 months prior to the project generating electricity. The requirements will include that NO_x and SO_x emissions will have to be monitored and a small quantity of SO_x allowance will have to be provided from a national SO_x allowance bank. Compliance will be determined at a later date.

Rule 4001 - New Source Performance Standards

Based on the heat rate of the GE Frame 7FA turbine, a NSPS NO_x limit is calculated at 109 ppmv at 15% O_2. The Western MSCC will be permitted at 2.5 ppmv at 15% O_2. The SO_x emission concentration will be 0.38 ppmv at 15% O_2 which is less than the NSPS requirement of 150 ppmv. The sulfur content of the natural gas fuel is equivalent to 0.003% which is less than the NSPS requirement of 0.8%. Compliance with Rule 4001 is therefore demonstrated.

Rule 4101 - Visible Emissions

All equipment will be limited to a 5 percent opacity limit by permit condition, which is less than the rule requirement of 20 percent opacity.

Rule 4201 - Particulate Matter Concentration

The District determined that the particulate emissions from the GE Turbines is 0.0022 gr/dscf, the cooling tower is 6.8×10^{-5} gr/dscf and the IC engines are 0.02 gr/dscf. These emission rates are below the rule limit of 0.1 gr/dscf, therefore compliance is demonstrated.

Rule 4703 - Stationary Gas Turbines

The permitted NO_x limit of 2.5 ppm is below the rule mandated limits of 12.2 ppm for SCR controlled turbines. The permitted CO limit of 6 ppm is well below the rule requirement of 25 ppm.

Rule 4801 - SO_2 Concentration

The fuel sulfur content of the natural gas to be used at the Western MSCC will result in a SO_2 emission concentration of 0.42 ppm @ 15% O_2 and is not expected to exceed the 2,000 ppm limit imposed by this rule.

Rule 8010 - Fugitive Dust Administrative Requirements for Control of Fine Particulate Matter (PM-10)

Western MSCC will provide a Construction Fugitive Dust Mitigation Plan that will discuss the types of chemical stabilizing agents and dust suppressant materials they intend to use.

Rule 8020 - Fugitive Dust Requirements for Control of Fine Particulate Matter (PM-10) from Construction, Demolition, Excavation, and Extraction Activities

The Construction Fugitive Dust Mitigation Plan will specify the specific measures that Western MSCC will employ to limit fugitive dust and thus comply with this rule.

Rule 8030 - Control of PM10 from Handling and Storage of Bulk Materials

The Construction Fugitive Dust Mitigation Plan will specify the specific measures that Western MSCC will employ to limit fugitive dust during the handling and transport of any borrow soil if needed and thus comply with this rule.

Rule 8060 - Control of PM10 from Paved and Unpaved Roads

The Construction Fugitive Dust Mitigation Plan will specify the use of chemical dust suppressant and/or the use of paved shoulders on paved roadways that will demonstrate compliance with this rule.

Rule 8070 - Control of PM10 from Vehicle/Equipment Parking, Shipping, Receiving, Transfer, Fueling and Service Areas

The Construction Fugitive Dust Mitigation Plan will include measures to limit fugitive dust from unpaved parking areas and the tracking out of mud and dirt onto public roadways, and thus demonstrate compliance with this rule.

CONCLUSIONS AND RECOMMENDATIONS

The Western MSCC's emissions of NOx, SO2 and CO will not cause a violation of any NO2, SO2 or CO ambient air quality standards, and therefore, their impacts are not significant. The 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. Western MSCC will reduce emissions to the extent feasible and provide emission offsets for their NOx, VOC, SO2 and PM10 emissions, and thus these mitigation measures reduce the potential for directly emitted PM10, as well as ozone and secondary PM10 formation to a level of insignificance.

The District has not submitted a Final Determination of Compliance for the Western MSCC and is not expected to prior to the release of this analysis. Staff has suggested Conditions of Certification based on the Preliminary Determination of Compliance as issued by the District on September 12, 2000. Therefore, if any changes in the Final Determination of Compliance occur, staff may need to file supplemental testimony.

CEC staff recommends the following Conditions of Certification AQ-C1 through AQ-C3 (CEC construction related mitigation) and AQ-1 through AQ-62 (District operation related mitigation) to assure compliance with the mitigation measure as discussed. With the adoption of these conditions, staff recommends the certification of the Western MSCC.

CONDITIONS OF CERTIFICATION

AQ-C1 The project owner shall require as a condition of its construction contracts that all contractors and subcontractors ensure that all heavy earthmoving equipment, that includes, but is not limited to bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks

and other heavy duty construction related trucks, have been properly maintained and the engines tuned to the engine manufacturer's specifications. The project owner shall further require as a condition of its construction contracts that this equipment shall employ high pressure fuel injection (common rail) system or engine timing retardation to control the emissions of oxides of nitrogen. The project owner shall further require as a condition of its construction contracts that all on-road gas powered vehicles are equipped with catalytic converters. The project owner shall further require as a condition of its construction contracts that all heavy construction equipment to the extent practical, shall remain running at idle for no more than five minutes.

Verification: The project owner shall submit to the CPM, via the Monthly Compliance Report, documentation, which demonstrates that contractor's and subcontractor's heavy earthmoving equipment is properly maintained and the engines are tuned to the manufacturer's specifications. The project owner shall maintain construction contracts on the site for six months following the start of commercial operation.

AQ-C2 The project owner shall install oxidizing soot filters on all suitable construction equipment used either on the power plant construction site or associated linear construction sites. Where the oxidizing soot filter is determined to be unsuitable, the owner shall install and use an oxidation catalyst. Suitability is to be determined by an independent California Licensed Mechanical Engineer who will stamp and submit for approval an initial and all subsequent Suitability Reports as necessary containing at a minimum the following:

INITIAL SUITABILITY REPORT:

The initial suitability report shall be submitted to the CPM for approval 60 days prior to rough grading breaking ground on the project site and will include:

- a list of all fuel burning, construction related equipment used,
- determination of the suitability of each piece of equipment to firstly work appropriately with an oxidizing soot filter;
- determination of the suitability of each piece of equipment to secondly work appropriately with an oxidation catalyst;
- if a piece of equipment is determined to be suitable for an oxidizing-soot filter;
- if a piece of equipment is determined to be unsuitable for an oxidizing-soot filter, an explanation will be provided by the independent California Licensed Mechanical Engineer as to the cause of this determination;
- if a piece of equipment is determined to be unsuitable for an oxidizing soot filter, but suitable for an oxidation catalyst and;

- if a piece of equipment is determined to be unsuitable for both an oxidizing-soot filter and an oxidizing catalyst, an explanation will be provide by the independent California Licensed Mechanical Engineer as to the cause of this determination.

INSTALLATION REPORT

- Following the installation of either the oxidizing soot filter or oxidizing catalyst as prescribed in the Initial Suitability Report, a California Licensed Mechanical Engineer will issue an Installation Report that either confirms that the installed device is functioning properly or that installation was not possible and the cause.

SUBSEQUENT SUITABILITY REPORTS

If a piece of construction equipment is subsequently determined to be unsuitable for an oxidizing soot filter or oxidizing catalyst after such installation has occurred, the filter or catalyst may be removed immediately. However notification must be sent to the CPM for approval containing an explanation for the change in suitability within 10 days.

Changes in suitability are restricted to one of the following three justifications and must be identified in any subsequent suitability report. Changes in suitability may not be based on the use of high-pressure fuel injectors, timing retardation and/or reduced idle time.

1. The filter or catalyst is reducing normal availability of the construction equipment due to increased downtime, and/or power output due to increased back pressure by 20% or more.
2. The filter or catalyst is causing or reasonably expected to cause significant damage to the construction equipment engine.
3. The filter or catalyst is causing or reasonably expected to cause a significant risk to nearby workers or the public.

Verification: The project owner will submit to the CPM for approval, the initial suitability report stamped by an independent California Licensed Mechanical Engineer, 60 days prior to rough grading on the project site. The project owner will submit to the CPM for approval, subsequent suitability reports as required, stamped by an independent California Licensed Mechanical Engineer no later than 10 working day following a change in the suitability status of any construction equipment.

AQ-C3 Prior to breaking ground at the project site, the project owner shall prepare a Construction Fugitive Dust Mitigation Plan that will specifically identify fugitive dust mitigation measures that will be employed for the construction of the Western Midway Sunset Cogeneration Project and related facilities.

Protocol: The Construction Fugitive Dust Mitigation Plan shall specifically identify measures to limit fugitive dust emissions from construction of the project site and linear facilities. Measures that should be addressed include the following:

- the identification of the employee parking area(s) and surface of the parking area(s);
- the frequency of watering of unpaved roads and disturbed areas;
- the application of chemical dust suppressants;
- the use of gravel in high traffic areas;
- the use of paved access aprons;
- the use of posted speed limit signs;
- the use of wheel washing areas prior to large trucks leaving the project site; and,
- the methods that will be used to clean tracked-out mud and dirt from the project site onto public roads.

Verification: At least sixty (60) days prior to breaking ground at the project site, the project owner shall provide the CPM with a copy of the Construction Fugitive Dust Mitigation Plan for approval.

SJVUAPCD Permit No. S-1135-313-0 - GE FRAME 7FA or Westinghouse 501F NATURAL GAS FIRED COMBINED CYCLE GAS TURBINE ENGINE/ELECTRICAL GENERATOR Unit D WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION, OXIDIATION CATALYST, AND STEAM,

SJVUAPCD Permit No. S-1135-314-0 - GE FRAME 7FA or Westinghouse 501F NATURAL GAS FIRED COMBINED CYCLE GAS TURBINE ENGINE/ELECTRICAL GENERATOR Unit E WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION, OXIDIATION CATALYST, AND STEAM,

AQ-1 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-2 The project owner shall submit selective catalytic reduction, oxidation catalyst, and continuous emission monitor design details to the District at

least 30 days prior to the construction of permanent foundations. [District Rule 2201]

Verification: The project owner shall provide copies of the drawings of the catalyst system chosen and the continuous emission monitor design detail to the CPM and the District at least 30 days prior to the construction of permanent foundations.

AQ-3 Combustion turbine generator (CTG) and electric generator lube oil vents shall be equipped with mist eliminators to maintain visible emissions from lube oil vents shall no greater than 5% opacity, except for three minutes in any hour. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-4 The CTG shall be equipped with an inlet air filter and continuously recording fuel gas flowmeter. [District Rule 2201]

Verification: The information above shall be included in the quarterly reports of Condition **AQ-35.**

AQ-5 CTG exhaust shall be equipped with continuously recording emissions monitor for NOx (before and after the SCR unit), CO, and O2 dedicated to this unit. Continuous emission monitors shall meet the requirements of 40 CFR parts 60 and 75 and shall be capable of monitoring emissions during startups and shutdowns as well as normal operating conditions. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-6 Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-7 Exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods. [District Rule 1081]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-8 Heat recovery steam generator design shall provide space for additional selective catalytic reduction catalyst and oxidizing catalyst if required to meet NOx and CO emission limits. [District Rule 2201]

Verification: Please refer to **Condition AQ-2**.

AQ-9 The project owner shall monitor and record exhaust gas temperature at the selective catalytic reduction and oxidation catalyst inlets. [District Rule 2201]

Verification: The project owner shall record the exhaust gas and selective catalytic reduction temperatures in the daily logs.

AQ-10 CTG shall be fired on natural gas, consisting primarily of methane and ethane, with a sulfur content no greater than 0.75 grains of sulfur compounds (as S) per 100 dry scf of natural gas. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-34.**

AQ-11 Startup is defined as the period beginning with initial turbine firing until the unit meets the lb/hr and ppmv emission limits in Condition AQ-15. Shutdown is defined as the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Startup durations shall not exceed three hours for the GE Frame 7FAs and four hours for the Westinghouse 501F. Shutdown shall not exceed one hour per occurance. [District Rule 2201 and 4001]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-12 Ammonia shall be injected when the selective catalytic reduction system catalyst temperature exceeds 500 degrees F. The project owner shall monitor and record catalyst temperature during periods of startup. [District Rules 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-13 During startup or shutdown of any gas turbine engine(s), combined emissions from both gas turbine engines (S-1135-313-0 and S-1135-314-0) heat recovery steam generator exhausts shall not exceed any of the following limits in any one hour:

NOx (as NO2)	517.7 lbs
CO	1850.9 lbs

[CEQA]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-14 By two hours after initial turbine firing, CTG exhaust emissions shall not exceed any of the following: NOx (as NO2) 12.2 ppmv @ 15% O2 and CO 200 ppmv @ 15% O2. [District Rule 4703]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-15 Emission rates from each CTG, except during startup or shutdown, shall not exceed any of the following emission limits:

GE Frame 7FA

PM10	9.4 lbs/hr
SO2	3.8 lbs/hr
NO2	16.7 lbs/hr and 2.5 ppmvd @ 15% O_2 averaged over 1-hr
VOC	3.2 lbs/hr and 1.4 ppmvd @ 15% O_2 averaged over 3-hr
CO	21.7 lbs/hr and 6 ppmvd @ 15% O_2 averaged over 3-hr
Ammonia	10 ppmvd @ 15% O_2 averaged over 24-hr

Westinghouse 501F

PM10	9.4 lbs/hr
SO2	3.9 lbs/hr
NO2	17.7 lbs/hr and 2.5 ppmvd @ 15% O_2 averaged over 1-hr
VOC	3.8 lbs/hr and 1.5 ppmvd @ 15% O_2 averaged over 3-hr
CO	27.2 lbs/hr and 6 ppmvd @ 15% O_2 averaged over 3-hr
Ammonia	10 ppmvd @ 15% O_2 averaged over 24-hr

[District Rule 2201, 4001 and 4703]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-16 Emission rates from each CTG, on days when a startup or shutdown occurs, shall not exceed any of the following:

GE Frame 7FA

PM10	226.6 lbs/day
SO2	90.24 lbs/day
NO2	850.1 lbs/day
VOC	467.2 lbs/day
CO	1,255.3 lbs/day

Westinhouse 501F

PM10	226.6 lbs/day
SO2	93.6 lbs/day
NO2	704.0 lbs/day
VOC	276.0 lbs/day
CO	2,368.0 lbs/day

[District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-17 Condition deleted.

AQ-18 Annual emissions from both CTGs calculated on a twelve consecutive month rolling basis shall not exceed any of the following:

GE Frame 7FA
PM10 – 151,167 lb/year
SOx (as SO2) – 61,094 lb/year
NOx (as NO2) – 274,906 lb/year
VOC – 83,982 lb/year
CO – 375,828 lb/year

Westinghouse 501F
PM10 – 151,527 lb/year
SOx (as SO2) – 60,404 lb/year
NOx (as NO2) – 287,220 lb/year
VOC – 87,893 lb/year
CO – 696,829 lb/year
[District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-19. Each one-hour period in a one-hour rolling average will commence on the hour. Each one-hour period in a three-hour rolling average will commence on the hour. The three-hour average will be compiled from the three most recent one-hour periods. Each one-hour period in a twenty-four-hour average for ammonia slip will commence on the hour. The twenty-four-hour average will be calculated starting and ending at twelve-midnight. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-20 Daily emissions will be compiled for a twenty-four period starting and ending at twelve-midnight. Each calendar month in a twelve-consecutive-month rolling emissions will commence at the beginning of the first day of the month. The twelve-consecutive-month rolling emissions total to determine compliance with annual emissions will be compiled from the twelve most recent calendar months. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-21 Prior to or upon startup of S-3523-1-0, -2-0, & 3-0, emission offsets shall be surrendered for all calendar quarters in the following amounts (shown below in pounds), at the offset ratio specified in Rule 2201 (6/15/95 version) Table 1.

GE Frame 7FA (pounds)

Pollutant	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Annual Total
PM10	38,001	38,424	38,846	38,846	154,117
SO2	15,064	15,232	15,399	15,399	61,094
NO2	67,785	68,538	69,291	69,291	274,905
VOC	20,708	20,938	21,168	21,168	83,982

Westinghouse 501F (pounds)

Pollutant	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Annual Total
PM10	38,090	38,513	38,937	38,937	154,477
SO2	14,894	15,060	15,225	15,225	60,404
NO2	70,821	71,608	72,395	72,395	287,219
VOC	21,672	21,913	22,154	22,154	87,893

[District Rule 2201]

Verification: The owner/operator shall submit copies of AERs or ERCs surrendered to the SJVUAPCD in the totals shown to the CPM prior to or upon startup of the CTGs or cooling tower.

AQ-22 NOx and VOC emission reductions that occurred from April through November may be used to offset increases in NOx and VOC respectively during any period of the year. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-21.**

AQ-23 NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.22 lb NOx at the appropriate distance ratio from Rule 2201, Table 1. [District Rule 2201]

Verification: The project owner shall provide records of the ERCs as part of **Condition AQ-21.**

AQ-24 At least 30 days prior to the construction of permanent foundations, the project owner shall provide the District with written documentation that all necessary offsets have been acquired or that binding contracts to secure such offsets have been entered into. [District Rule 2201]

Verification: The project owner shall provide records of the ERCs as part of **Condition AQ-21.**

AQ-25 Compliance with ammonia slip limit shall be demonstrated by using the following calculation procedure: ammonia slip ppmv @ 15% O2 = ((a-(bxc/1,000,000)) x 1,000,000 / b) x d, where a = ammonia injection rate(lb/hr)/17(lb/lb. mol), b = dry exhaust gas flow rate (lb/hr)/(29(lb/lb. mol), c = change in measured NOx concentration ppmv at 15% O2 across catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip. Alternatively, the project owner may utilize a continuous in-stack ammonia monitor, acceptable to the District, to monitor compliance. At least 60 days prior to using a NH3 CEM, the project owner must submit a monitoring plan for District review and approval [District Rule 4102]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-26. Compliance with the short term emission limits (lb/hr and ppmv @ 15% O2) shall be demonstrated within 90 days of initial operation of each gas turbine engine and annually thereafter by District witnessed in situ sampling of exhaust gasses by a qualified independent source test firm at full load conditions as follows - NOx: ppmvd @ 15% O2 and lb/hr, CO: ppmvd @ 15% O2 and lb/hr, VOC: ppmvd @ 15% O2 and lb/hr, PM10: lb/hr, and ammonia: ppmvd @ 15% O2. Sample collection to demonstrate compliance with

ammonia emission limit shall be based on a two hour or longer average. [District Rule 1081]

Verification: The project owner shall provide records of compliance as part of **Condition AQ-29.**

AQ-27. Compliance with the startup NOx, CO, and VOC mass emission limits shall be demonstrated for one of the CTGs (S-1135-313-0 and S-1135-314-0) upon initial operation and at least every seven years thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. [District Rule 1081]

Verification: The project owner shall provide records of compliance as part of **Condition AQ-29.**

AQ-28 Compliance with natural gas sulfur content limit shall be demonstrated within 60 days of operation of each gas turbine engine and periodically as required by 40 CFR 60 Subpart GG and 40 CFR 75. [District Rules 1081, 2540, and 4001]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-29 The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. Official test results and field data collected by source tests required by conditions on this permit shall be submitted to the District within 60 days of testing. [District Rule 1081]

Verification: The project owner shall notify the CPM and the District 30 days prior to any compliance source test. The project owner shall provide a source test plan to the CPM and District for the CPM and District approval 15 days prior to testing. The results and field data collected by the source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-30 Source test plans for initial and seven-year source tests shall include a method for measuring the VOC/CO surrogate relationship that will be used to demonstrate compliance with VOC lb/hr, lb/day, and lb/twelve month rolling emission limits. [District Rule 2201]

Verification: The project owner shall provide a source test plan to the CPM and District for the CPM and District approval 15 days prior to testing. The results and field data collected by the source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-31 The following test methods shall be used PM10: EPA method 5 (front half and back half), NOx: EPA Method 7E or 20, CO: EPA method 10 or 10B, O2: EPA Method 3, 3A, or 20, VOC: EPA method 18, ammonia: BAAQMD ST-1B, and fuel gas sulfur content: ASTM D3246. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 4001, and 4703]

Verification: The project owner shall provide records of compliance as part of **Condition AQ-29.**

AQ-32 The project owner shall notify District of date of initiation of construction no later than 30 days after such the date, date of anticipated startup not more than 60 days nor less than 30 days prior to such date, and date of actual startup within 15 days after such date. [District Rule 4001]

Verification: The project owner shall notify the CPM and the District of the date of initiation of construction no later than 30 days after such date. The project owner shall notify the CPM and the District of the date of anticipated startup not more than 60 days nor less than 30 days prior to such date, and the date of actual startup within 15 days after such date.

AQ-33 The project owner shall maintain hourly records of NOx, CO, and ammonia emission concentrations (ppmv @ 15% O2), and hourly, daily, and twelve month rolling average records of NOx and CO emissions. Compliance with the hourly, daily, and twelve month rolling average VOC emission limits shall be demonstrated by the CO CEM data and the VOC/CO relationship determined by annual CO and VOC source tests. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-34 The project owner shall maintain records of SOx lb/hr, lb/day, and lb/twelve month rolling average emission. SOx emissions shall be based on fuel use records, natural gas sulfur content, and mass balance calculations. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-35 The project owner shall maintain the following records for the CTG: occurrence, duration, and type of any startup, shutdown, or malfunction; performance testing, evaluations, calibrations, checks, adjustments, any period during which a continuous monitoring system or monitoring device was inoperative, maintenance of any continuous emission monitor; emission

measurements, total daily and annual hours of operation; and hourly quantity of fuel used, and gross three hour average operating load. [District Rules 2201 & 4703]

Verification: The project owner shall compile required data and submit the information to the CPM in quarterly reports submitted no later than 60 days after the end of each calendar quarter.

AQ-36 The project owner shall maintain the following records on a daily basis: the actual local time startup and stop time, length and reason for reduced load periods, total hours of operation, and the type and quantity of fuel used as required by Section 6.2.4 of Rule 4703. [District Rules 2201 & 4703]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of **Condition AQ-35.**

AQ-37 All records required to be maintained by this permit shall be maintained for a period of five years and shall be made readily available for District inspection upon request. [District Rule 2201]

Verification: The project owner shall make records available for inspection by representatives of the District, CARB and the Commission upon request.

AQ-38 Results of continuous emissions monitoring shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3. 3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA. [District Rule 1080]

Verification: The project owner shall compile the required data in the formats discussed above and submit the results to the CPM quarterly.

AQ-39 The project owner shall notify the District of any breakdown condition as soon as reasonably possible, but no later than one hour after its detection, unless the owner or operator demonstrates to the Districts satisfaction that the longer reporting period was necessary. [District Rule 1100]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the quarterly reports of **Condition AQ-35**.

AQ-40 The District shall be notified in writing within ten days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those

allowed, and the methods utilized to restore normal operations. [District Rule 1100]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the quarterly reports of **Condition AQ-35**.

AQ-41 Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

Verification: The project owner shall submit the continuous emission monitor audit results with the quarterly reports required of **Condition AQ-43**.

AQ-42 The project owner shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F . [District Rule 1080]

Verification: The project owner shall submit the continuous emission monitor results with the quarterly reports of **Condition AQ-43**.

AQ-43 The project owner shall submit a written report to the APCO for each calendar quarter, within 30 days of the end of the quarter, including: time intervals, data and magnitude of excess emissions, nature and cause of excess (if known), corrective actions taken and preventive measures adopted; averaging period used for data reporting shall correspond to the averaging period for each respective emission standard; applicable time and date of each period during which the CEM was inoperative (except for zero and span checks) and the nature of system repairs and adjustments; and a negative declaration when no excess emissions occurred . [District Rule 1080]

Verification: The project owner shall compile the required data and submit the quarterly reports to the CPM and the APCO within 30 days of the end of the quarter.

AQ-44 The project owner shall submit an application to comply with Rule 2540 - Acid Rain Program 24 months before the unit commences operation. [District Rule 2540]

Verification: The project owner shall file their application with the District at least 24 months prior to the commencement of operation of any of the combustion turbine generators.

Conditions of Certification AQ-45 through AQ-52 apply to the following equipment:

FORCED DRAFT COOLING TOWER WITH 7 CELLS AND HIGH EFFICIENCY DRIFT ELIMINATOR:

AQ-45 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-46 The project owner shall submit drift eliminator design details and vendor specific emission justification for the correction factor to be used to correlate blowdown TDS to drift TDS and the amount of drift that stays suspended in the atmosphere in the equation in **Condition AQ-51** to the District at least 30 days prior to commencement of construction. [District Rule 2201]

Verification: 30 days prior to commencement of construction of the cooling towers, the project owner shall submit the information required above to the District and the CPM.

AQ-47 The project owner shall submit cooling tower design details including the cooling tower type and materials of construction to the District at least 30 days prior to commencement of construction, and at least 90 days before the tower is operated. [District Rule 7012]

Verification: 30 days prior to commencement of construction of the cooling towers, the project owner shall submit the information required above to the District and the CPM.

AQ-48 No hexavalent chromium containing compounds shall be added to cooling tower circulating water. [District Rule 7012]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-49 Drift eliminator drift rate shall not exceed 0.0006%. [District Rule 2201]

Verification: The project owner shall submit documentation from the selected cooling tower vendor that verifies the drift efficiency to the CPM 30 days prior to commencement of construction of the cooling towers.

AQ-50 PM10 emission rate shall not exceed 8.08 lb/day. [District Rule 2201]

Verification: Please refer to **Condition AQ-51**.

AQ-51 Compliance with the PM10 daily emission limit shall demonstrated as follows: PM10 lb/day = circulating water recirculation rate * total dissolved solids concentration in the blowdown water * design drift rate * correction factor. [District Rule 2201]

Verification: The project owner shall compile the required daily PM10 emissions data and maintain the data for a period of five years. The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-52 Compliance with PM10 emission limit shall be determined by circulating water sample analysis by independent laboratory within 90 days of initial operation and weekly thereafter. [District Rule 1081]

Verification: The project owner shall compile the required daily PM10 emissions data and maintain the data for a period of five years. The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

Conditions of Certification AQ-53 through AQ-62 apply to the following equipment:

SAMPLE EQUIPMENT DESCRIPTION: 368 HP DETROIT DIESEL MODEL DDFP-06FA DIESEL-FIRED IC ENGINE POWERING EMERGENCY FIRE WATER PUMP S-1135-316-0:

AQ-53 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-54 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-55 Engine shall be equipped with a turbocharger and intercooler/aftercooler. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-56 Engine shall be equipped with an operational non-resettable hour meter. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-57 The engine shall be equipped with a positive crankcase ventilation (PCV) system or a crankcase emissions control device of at least 90% control efficiency unless UL certification would be voided. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-58 The diesel engine shall be operated with an initial injection timing of 16 degrees BTDC (before top dead center) or less. [District Rule 2201].

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-59 The sulfur content of the diesel fuel used shall not exceed 0.05% by weight. [District Rule 2201]

Verification: Please refer to **Condition AQ-62**.

AQ-60 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-61 The engine shall be operated only for maintenance, testing, and required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 200 hours per year. [District Rules 2201 and 4701]

Verification: The project owner shall compile records of hours of operation of any of the IC engines and include those records as part of the quarterly reports submitted to the CPM under **Condition AQ-35**.

AQ-62 The project owner shall maintain records of hours of non-emergency operation and of the sulfur content of the diesel fuel used. Such records shall be made available for District inspection upon request for a period of five years. [District Rules 2201 and 4701]

Verification: The project owner shall compile records of hours of operation of the IC engines and of the diesel fuel purchased that includes the sulfur content, and maintain the data for a period of five years. The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

REFERENCES

APCD (San Joaquin Valley Unified Air Pollution Control District) 2000e, Ozone Rate Progress Report. Docketed 11/09/00. Ref. 16619

APCD 2000f, San Joaquin Valley Unified Air Pollution Control District, Preliminary Determination of Compliance for Western Midway-Sunset Cogeneration Company Power Plant Expansion, 9-12-00: Ref 15819

ARB 1998 - Air Resource Board. "Proposed Amendments to the Designation Criteria and Amendments to the Area Designations for State Ambient Air Quality Standards". August 1998.

ARB, 1993-1997. California Air Quality Data, Annual and Quarterly Summaries. Aerometric Division. Sacramento.

ARB 1996 - Air Resources Board. "Second Triennial Review of the Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California". October, 1996.

EPA (US Environmental Protection Agency) 1995. Compilation of Air Emission Factors. Document AP-42.

Chow, et al 1993. Judith C. Chow, John G. Watson and Douglas H. Lowenthal. "PM10 and PM2.5 Compositions in California's San Joaquin Valley" Aerosol Science and Technology, the Journal of the American Association for Aerosol Research.

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

Midway (Western Midway Sunset Co) 1999a. Application for Certification. Submitted to the California Energy Commission/Smith on December 22, 1999.

Midway (Western Midway Sunset Co) 2000d. Supplementary AFC Material in Response to Data Adequacy Worksheets. Submitted to the California Energy Commission on February 9, 2000.

Midway (Western Midway Sunset Co) 2000e. Electronic Data Files for Appendix 0-9 (Air Quality); Appendix X-4 (Public Health); Appendix 0-16 (Air Quality Supplement) Submitted to the California Energy Commission on February 9, 2000.

Midway (Western Midway Sunset) 2000g. Application for Determination of Compliance Supplemental Information. Submitted to California Energy Commission on February 23, 2000.

Midway (Western Midway Sunset Co.) 2000q. Application for Determination of Compliance for the Western MSCC Project(Attachment: Proof of Service) Submitted to the San Joaquin Valley Unified APCD/Golf/Adams on April 21, 2000.

Midway (Western Midway Sunset Co./Western) 2000s. Supplementary AFC Material in response to Data Adequacy Worksheets – POS 10 Electronic Data files: Appendix 0-9 (Air Quality) Appendix X-4. Submitted to California Energy Commission/Dockets on May 4, 2000.

Midway (Western Midway Sunset Co./Western) 2000u. Revised Preliminary Impact Analysis Modeling Results Application for Prevention of Significant Impact. Submitted to the US Environmental Protection Agency/Haber on May 16, 2000.

Sylte 1999. Submittal from William W. Sylte entitled “The Use of PM10 Precursor Offsets for the Proposed La Paloma Generating Project” to California Energy Commission, Docket Unit. January 19.

APCD (San Joaquin Valley Unified Air Pollution Control District) Ozone Rate Progress Report. Docketed 11/09/00. Ref. 16619 Cited in text as (APCD 2000e)

PUBLIC HEALTH

Testimony of Obed Odoemelam, Ph.D.

INTRODUCTION

Operating the proposed 500 megawatt Western Midway Sunset Cogeneration Company Project (Western MSCC) would create combustion products and possibly expose the general public and workers to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The purpose of this public health analysis is to determine whether a significant health risk would result from public exposure to these chemicals and combustion by-products routinely emitted during project operations. The issue of possible worker exposure is addressed in the **Worker Safety and Fire Protection** section of this Preliminary Staff Assessment (PSA). Exposure to electric and magnetic fields (EMF) is addressed in the **Transmission Line Safety and Nuisance** section.

The exposure of primary concern in this section is to pollutants for which no air quality standards have been established. These are known as noncriteria pollutants, toxic air pollutants, or air toxics. Those for which ambient air quality standards have been established are known as criteria pollutants. Since, as noted in the **Air Quality** section, this project is proposed for an area with existing violations of specific air quality standards, the potential for impact exacerbation is addressed in this **Public Health** section in assessing the need for specific mitigation.

The criteria pollutants are also 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 controlling both types of pollutants when emitted from the same source. Compliance with the required control technologies is discussed in the **Air Quality** section.

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.

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 criteria pollutants as well as 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 "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 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 et seq. mandates that the California Environmental Protection Agency (Cal-EPA) 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 ARB's April 11, 1996 California Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines. Cal-EPA has developed specific cancer potency estimates for assessing their related cancer risks at specific exposure levels. For noncancer-causing toxic air pollutants, Cal-EPA established specific no-effects levels (known as reference exposure levels, or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels. The Energy Commission staff (staff) uses these Cal-EPA potency estimates and reference exposure values in its health risk 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 risks involved. CARB and the Air Quality Management District will ensure implementation of these requirements for the proposed project.

LOCAL

The San Juaquin Unified Air Pollution Control District (SJUAPCD, or the 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 Determination of Compliance. Midway Sunset Cogeneration Company (MSCC) has complied with this requirement.

SETTING

According to information from the applicant, the proposed Western MSCC facility will be located on a 10-acre site immediately adjacent to the site of the applicant's existing 225 megawatt cogeneration plant in Western Kern County, California,

approximately 40 miles from Bakersfield. Both sites will be combined into one after construction is completed (Midway 1999a, pages 1-3, 5.9-13 and 5.9-14). The existing MSCC power plant currently contributes to background pollutant levels in the project area.

The proposed location is at the foot of the Temblor Mountain Range where the surrounding land is primarily rural with some industrial use for oil and gas production. No new developments have been proposed within a two-mile radius of the site. The nearest communities are Derby Acres, 2.5 miles the southwest, Fellows, approximately 6 miles to the northwest, and McKittrick approximately 6 miles to the south. According to the Kern County General Plan, the project area is zoned for agricultural/mineral petroleum production (Midway 1999a, page 5.9-14).

The applicant has identified and staff concurs that there are a number of sensitive receptor facilities within 6 miles (10 Km) of the site (Midway 1999a, page 5.16-4). These sensitive receptors are located in facilities in the Derby Acres, Fellows, and McKittrick, these receptors include children, the elderly and those with existing illness. These groups are usually more susceptible than the general population to the effects of environmental pollutants, therefore, extra consideration is given to possible effects in these individuals in establishing exposure limits for environmental pollutants.

As discussed by the applicant, the project area is non-attainment (meaning that its ambient levels are currently higher than applicable air quality standards) for ozone and PM10 at the state and federal levels because of pollutant transportation from the other parts of the air basin. Such non-attainment status requires the offsetting of these two pollutants or their precursors as contributed by the project and any other new sources in the air basin.

Ozone is only formed secondarily from the sunlight-driven interaction of its precursor pollutants (NOx and volatile organic compounds, VOCs) locally generated or transported from one point to the other. Since such transportation occurs throughout a given air basin, any ozone problem is considered a basin-wide problem for which a basin-wide control strategy is formulated by the local Air District with respect to precursor sources. This strategy consists of (a) emission control requirements with respect to each project's emissions and (b) offset requirements with respect to the basin-wide precursor transport.

PM10 also constitutes a basin-wide problem as derived from fugitive dust, the interaction of its precursors (which include NOx and VOCs), or emitted directly from sources throughout the air basin. However, emissions from each given source could create a localized health problem when project-related exposures are added to the existing basin-wide, background levels. The potential for localized impacts is minimized through specific emission controls, while its potential contribution on a basin-wide basis is minimized through specific offset requirements.

METHOD OF ANALYSIS

Any significant pollution-related impacts from this type of project would be mainly associated emissions from its natural gas-fired combustion turbines. Potential public exposure in the surrounding area is estimated through air dispersion modeling. It is these exposure estimates, along with data characterizing the existing conditions, that staff uses to establish whether total exposures will be above or below the applicable air quality standards or reference exposure levels established against noncancer effects. For cancer-causing (or carcinogenic) effects, such assessment is made in terms of the potential for exposure at levels whose related cancer risks are considered significant by regulatory agencies. 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 possible health effects;
- 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; and
- A risk characterization step in which the nature and the magnitude of the possible human health risk is assessed.

HEALTH EFFECTS ASSESSED

Health risks from a source of air pollutants can result from high-level exposure, which creates immediate-onset (acute) effects, or prolonged low-level exposure, which creates chronic effects. Noncancer effects are assumed to result after exposure above specific thresholds.

For natural gas-burning facilities such as MSCC, high-level exposure to toxic pollutants (which could cause acute effects) could occur only during major accidents and is not expected from routine operations when emissions are much lower. When the area is designated as non-attainment for a criteria pollutant, the possibility of health impacts could increase with further additions of that same pollutant from a new project.

Since acute health impacts are not associated with normal noncriteria pollutant emissions, effects from chronic exposures are considered of greater concern than acute effects in assessing the potential for impacts. Such chronic effects may manifest as cancer or health effects other than cancer. Only noncancer effects are expected from chronic exposures to the criteria pollutants, which are non-carcinogenic.

ASSESSING THE LIKELIHOOD OF NONCANCER EFFECTS

The method used by regulatory agencies to assess the likelihood of acute or chronic pollutant impacts is the hazard index method. In this approach, a hazard

index is calculated as a numerical representation of the likelihood of significant health impacts at the exposure levels expected for the source in question. This index is calculated by dividing the exposure estimate by the applicable reference exposure level or air quality standard. After calculating the hazard indices for the individual pollutants, these indices are added together with all those that affect the same part of the body or target organ, then a total hazard index can be obtained. Total hazard indices of 1.0 or less are regarded as indicative of a potential lack of significant effects. However, exposure yielding a total hazard index of more than 1.0 may indicate a significant potential for the noncancer effects being considered.

In a non-attainment area, the hazard index for background exposures would be more than 1.0 for the criteria pollutant involved. For any proposed project, the hazard index for the operational phase would be obtained by dividing total (background plus project-related) exposure by the applicable air quality standard. Since all air quality standards are health-protective limits that are not to be exceeded, further additions from the project would necessitate additional mitigation with respect to the pollutant in question. The pollutant-specific hazard index that is calculated for the operational-phase exposure would facilitate the **Air Quality** staff's analysis to establish the level of mitigation necessary.

ASSESSING THE POTENTIAL RISK OF CANCER

According to present understanding, cancer from carcinogenic exposure results from biological effects at the molecular level. Such effects are currently assumed possible from every exposure to a carcinogen. Therefore, staff and other regulatory agencies generally consider the likelihood of cancer as more sensitive than the likelihood of noncancer effects for assessing the environmental acceptability of a source of pollutants. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process.

For any source of specific concern, the potential risk of cancer is obtained by multiplying the exposure estimate by the potency factors for the individual carcinogens involved. These potency factors are numerical values established to represent the cancer-causing potential of one carcinogen as compared to the others. After calculating these individual risk values, they are added together for the project's carcinogens to obtain the total incremental cancer risk associated with operations. Given the conservatism in the various phases of this risk calculation process, these numerical estimates are regarded as only representing the upper bounds on the cancer risk at issue. The actual risk will likely be lower and could indeed be zero. The significance of these estimates as indicators of a real cancer hazard is assessed according to specific evaluative criteria.

STAFF'S SIGNIFICANCE CRITERIA

Various state and federal agencies specify different cancer risk levels as levels of significance with regard to specific sources. For example, a risk of 10 in a million is considered under the Air Toxics "Hot Spots" (AB 2588) and the Proposition 65 programs as significant, and therefore, used as a threshold for public notification in cases of air toxics emissions from existing sources. The San Joaquin Unified Air Pollution Control District considers the same risk of 10 in a million as acceptable for

a source (such as Midway Sunset) in which the best available control technology for air toxics (T-BACT) is used.

The Energy Commission staff considers a potential cancer risk of one in a million as the de minimis level, which is the level below which the related exposure is negligible (meaning that project operation is not expected to result in any increase in cancer). Above this level, further mitigation could be recommended after consideration of issues related to the limitations of the risk assessment process.

For noncarcinogenic pollutants, staff considers significant health impacts to be unlikely when the hazard index estimate is 1.0 or less. If more than 1.0, staff would regard the related emissions as potentially significant from an environmental health perspective but would recommend specific mitigation only after consideration of issues related to the uncertainties in the assessment process.

IMPACTS

PROJECT SPECIFIC IMPACTS

The health impacts from the siting and operation of the proposed Midway Sunset Project can be considered separately as construction-phase impacts and operational-phase impacts.

CONSTRUCTION PHASE IMPACTS

Construction-phase impacts, as noted by the applicant (Midway 1999a, pages 5.2-28 through 5.2-30, Appendix O, 2000a, pages SI-5.2-1 through SI-5.2-4), are those from human exposure to (a) the windblown dust and related PM10 from site grading and other construction-related activities and (b) emissions from the heavy equipment and vehicles to be used for such construction. Upon reviewing their method and data, staff finds that the applicant used an acceptable procedure for estimating the project's construction-related PM10 from dust generation.

The applicant showed, from their analysis that construction activities could, for a relatively short period, result in ambient concentrations above the state's air quality standards for NOx and PM10 in a limited area around the project site (Midway 1999a, page 5.2-37). In the case of PM10, such high-level impact levels would be due to its relatively high background levels for which the area is designated as non-attainment for PM10. The project's contribution would be one third of this standard.

The applicant has specified the specific dust control measures required by District Rules (8010, 8020, 8030 and 8070) with respect to sources such as Midway Sunset. They intend to comply with these rules as specifically reflected in related conditions for certification in the **Air Quality** section. Staff considers these procedures as adequate for minimizing the project's contribution in this short construction period to the existing PM10 problem.

Potential NOx impacts were calculated by the applicant to reflect the highest impacts possible. Actual impacts would likely be lower. As with PM10, these areas

of potential impacts are uninhabited, meaning that there would be no significant public exposures. Since chronic impacts are not usually expected from equipment emissions within this relatively short construction period, only acute health effects could be significant in the project's impact areas. Given that there will be no public exposures, staff does not expect these emissions to pose a significant risk of such acute health impacts.

A phase I site assessment survey provided no evidence of surface or subsurface contamination at the project site nor along the route of the project's transmission line (Midway 1999a, page 5.14-14). This means that dust exposures would not involve any concurrent exposure to soil contaminants.

DIRECT OPERATIONAL IMPACTS

The applicant conducted the health risk assessment for the project-related noncriteria pollutants of potential significance. This assessment was conducted according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines for sources of this type. The results were provided to staff along with documentation of the assumptions used (Midway 1999a, pages 5.16-3 through 5.16-10, and Appendix O). 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 risk estimates.

Staff has found these assumptions to be generally acceptable for evaluating the proposed project. We concur with the applicant's findings with regard to the numerical public 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. These analyses were conducted to establish 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.

IMPACTS ASSOCIATED WITH THE PROJECT'S NONCRITERIA POLLUTANTS.

The following noncriteria pollutants were considered with respect to noncancer effects: ammonia, in case of use of the selective catalytic reduction (SCR) system alternative for NOx control, acetaldehyde, acrolein, benzene, 1,3 butadiene; ethylbenzene, formaldehyde, hexane, naphthalene, polycyclic aromatic hydrocarbons (PAHs), propylene oxide, toluene, and xylenes. The following were

considered with regard to a possible cancer risk: acetaldehyde, benzene, 1,3 butadiene, formaldehyde, PAHs and propylene oxide.

A chronic maximum hazard index of 0.36 was calculated (Midway 1999a, pages 5.16-6 through 5.16) for an uninhabited location about 2.5 Km (1.6 miles) southwest of the facility. The maximum hazard index at inhabited locations in Derby Acres and McKittrict are 0.0047 and 0.0061, respectively. The maximum acute hazard was calculated as 0.72. These indices are all below levels suggesting the potential for health effects.

The highest combined incremental cancer risk was estimated at 1.4 in a million for an individual at the same maximum location identified for the total hazard indices for chronic effects. This risk was calculated using existing procedures, which assume that the individual would be exposed at the highest possible levels to all the carcinogenic pollutants from the project for 70 years. While this risk value is above staff's de minimis level, it is at a level for which staff does not consider additional mitigation to be necessary. It is also below the level acceptable to the Air District for sources such as the existing MSCC power plant. Furthermore, this location of maximum cancer risk is largely unihabitable, foreclosing the potential for the long-term exposure normally associated with the cancer. The maximum risk at the nearest location of human habitation in Derby Acres is 0.02 in a million.

IMPACTS ASSOCIATED WITH THE PROJECT'S CRITERIA POLLUTANTS

Only ozone and PM10 were considered among the project's criteria pollutants, because of the project area's noted designation as non-attainment for both pollutants. As presented by the applicant, (Midway 1999a, page 5.2-6, and 2000a, page SI-5.2-6) the highest area background ozone concentration as measured in 1993, is 0.13 parts per million (ppm), which, when divided by the state's 1-hour 0.09 ppm standard yields a maximum background hazard index of 1.44.

A maximum background PM10 level of 109 ug/m3 was measured in the project area. Dividing this by the state's 24-hr standard of 50.1 ug/m3 would yield a hazard index of 2.18, pointing to an existing health hazard. The emission controls and offset requirements to mitigate Midway Sunset's additions are specified in the **Air Quality** section with respect to both PM10 and ozone.

CUMULATIVE IMPACTS

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. Analyses of such emissions have shown, however, that the peak impacts of such toxic pollutants are normally localized within relatively short distances from the source. Toxic pollutant levels beyond the point of maximum impact normally fall within ambient background levels. We note in this case that the point of maximum impacts was identified as a location only 2.5 Km from the project site. Therefore, potentially significant cumulative impacts are only expected in situations where major sources are located adjacent to one another.

The applicant (Midway 1999a, pages 5.16-13) did not specifically consider the contribution of the existing MSCC 225-megawatt plant in assessing the potential for cumulative impacts at levels of health significance. They considered only the proposed La Paloma, Sunrise, and Elk Hills with respect to the toxic pollutants at issue. Judging from (a) the points of maximum impacts for each project and (b) the magnitude of the health risk potentially associated with their respective emissions, the applicant determined that any cumulative exposures would be unlikely at levels of health significance. Staff concurs with the applicant's conclusions with respect to the projects considered. Contributions from the applicant's existing facility would be unlikely to significantly add to such cumulative exposures given the relatively low levels of its toxic emissions as established during the application process. The related, maximum cancer risk as staff established from staff's health analysis was 0.002 in a million (CEC Public Health Staff, 1986, pages 5-1 through 5-17). Staff considers cancer risks at such levels as reflecting toxic emissions to be at levels of insignificance with regard to direct or contribution to existing impacts.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has determined that the construction and operation of the proposed natural gas-burning project will not pose a significant public health risk to the surrounding population with regard to the toxic pollutants considered. However, ozone and PM10 levels are encountered at background levels posing a significant hazard to human health. The mitigation measures in the **Air Quality** section are acceptable to staff and are in keeping with the Air District's plans for a measured, basin-wide reduction of this health hazard.

RECOMMENDATIONS

Since ozone and PM10 are encountered in the project area at potentially hazardous levels, staff recommends adoption of the ozone and PM10-specific mitigation measures and conditions of certification specified in the **Air Quality** section. No significant public health impacts are considered likely by staff with regard to toxic emissions from the proposed project. Therefore, no Public Health Conditions of Certification are proposed with respect to these pollutants.

REFERENCES

California Air Pollution Control Officers Association (CAPCOA) 1993. Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines. Prepared by the Toxics Committee, October 1993.

California Energy Commission Staff 1986. Final Public Health Staff's Assessment for the Midway-Sunset Cogeneration Project.

California Air Resources Board (ARB) 1996. California Toxic Emissions Factors (CATEF) Database for Natural Gas-Fired Combustion Turbine Cogeneration.

Midway (Western Midway Sunset Co 1999a. Application for Certification (AFC), Volumes I, II and III. Submitted to the California Energy Commission on December 22, 1999.

Midway Sunset Cogeneration Company 2000d. Supplemental AFC Material in Response to Data Adequacy Worksheets. Submitted to the California Energy Commission on February 9, 2000.

WORKER SAFETY AND FIRE PROTECTION

Testimony of Kathleen Hann

INTRODUCTION

Worker safety and fire protection is governed by laws, ordinances, regulations, and standards (LORS), and enforced through regulations codified at the Federal, State, and local levels. Worker safety is of utmost priority at the project location and is documented through worker safety practices and training. Industrial workers at the facility operate process equipment and handle hazardous materials daily, and may face other hazards, which can result in accidents and serious injury. Protection measures are employed to either eliminate these hazards or minimize the risk through special training, protective equipment or procedural controls.

The purpose of this analysis is to assess the adequacy worker safety and fire protection measures proposed by Midway Sunset Cogeneration Company (MSCC) for the Western MSCC project. Staff has reviewed the original Application for Certification (AFC) dated December 22, 1999, the February 8, 2000 Supplemental Information (Response to Data Adequacy Worksheets), the February 29, 2000 Supplemental Information #2, and the May 4, 2000 Data Request Responses #2. Staff's analysis focused on determining whether MSCC has proposed adequate measures to:

- comply with applicable safety laws, ordinances, regulations and standards (LORS);
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

Staff has determined that the proposed project will comply with applicable LORS and will not present unusual industrial safety or fire protection problems. Issues regarding impacts on local fire protection service are addressed through proposed condition of certification, **Worker Safety – 3**

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act of 1970 (the Act). The Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § 651 (29 U.S.C. §§ 651 through 678). This public law is codified at Title 29 of the Code of Federal Regulations, under General Industry Standards, Parts 1910.1 through 1910.1450 (29 CFR Part 1910.1-1910.1450) and clearly defines the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector.

Most of the safety and health standards now in force under the Act for general industry represent a compilation of materials authorized by the Act from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI), and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The congressional purpose of the Act is to "assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources," (29 USC § 651). The Federal Department of Labor promulgates and enforces safety and health standards that are applicable to all businesses affecting interstate commerce. The Department of Labor established the Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the Act.

Applicable Federal requirements include:

- 29 U.S. Code § 651 et seq. (Occupational Safety and Health Act of 1970)
- 29 CFR Part 1910.1-1910.1450 (Occupational Safety and Health Administration Safety and Health Regulations)
- 29 CFR Part 1952.170–1952.175 (Federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR Part 1910.1–1910.1500)

STATE

California passed the Occupational Safety and Health Act of 1973 ("Cal/OSHA") as published in the California Labor Code § 6300. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with Part 450 (8 CCR Part 450 et seq.) The California Labor Code requires that the State Standards Board must adopt standards at least as effective as the federal standards, which have been, promulgated (Calif. Labor Code §142.3(a)). Health and Safety laws meet or exceed the Federal requirements. Hence, California obtained federal approval of its State health and safety regulations, in lieu of the federal requirements published at 29 CFR Parts 1910.1-1910.1500). The Federal Secretary of Labor, however, continually oversees California's program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

The State of California Department of Industrial Relations is charged with responsibility for administering the Cal/OSHA plan. The Department of Industrial Relations is further split into six divisions to oversee, among other activities: industrial accidents, occupational safety and health, labor standards enforcement, statistics and research, and the State Compensation Insurance Fund (workers compensation).

Employers are responsible to insure that their employees are informed about workplace hazards, potential exposure and the work environment (Calif. Labor Code § 6408). Cal/OSHA's principal tool in ensuring that workers and the public

are informed is the Material Safety Data Sheet (MSDS) (8 CCR § 5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1990 (1980 Calif. § 874 and Calif. Labor Code §§ 6360-6399.7). It mirrored the Federal Hazard Communication Standard (29 CFR Part 1910.1200) which established an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers.

Finally, California Senate Bill 198 required that employers establish and maintain a written Injury and Illness Prevention Program to identify workplace hazards and communicate them to its employees through a formal employee training program (8 CCR 3203).

Applicable State requirements include:

- 8 CCR § 339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act
- 8 CCR § 450, et seq. Cal/OSHA regulations
- 24 CCR § 3, et seq. - incorporates the current edition of the Uniform Building Code
- La Follette Bill (Health and Safety Code § 25500, et seq.) - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility
- Health and Safety Code § 255000-25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility

LOCAL

The California Building Standards Code published at Title 24 of the California Code of Regulations, (24 CCR § 3, et seq.) is comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The Building Standards Code includes the electrical, mechanical, energy, and fire codes applicable to the project. Local planning /building & safety departments enforce the California Uniform Building Code.

National Fire Protection Association (NFPA) standards are published in the California Fire Code. The fire code contains general provisions for fire safety, including, but not restricted to: 1) required road and building access; 2) water supplies; 3) installation of fire protection and life safety systems; 4) fire-resistive construction; 5) general fire safety precautions; 6) storage of combustible materials; 7) exits and emergency escapes; and 8) fire alarm systems. The California Fire Code reflects the body of regulations published at Part 9 of the California Code of Regulations pertaining to the California Fire Code. (24 CCR Part 9) as defined in the California Building Standards Law (California Health and Safety Code §18901)

Similarly the Uniform Fire Code Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and

Materials and the NFPA. It is the United State's premier model fire code. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition.

Applicable local requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9)
- Uniform Fire Code Standards
- California Building Code Title 24, California Code of Regulations (24 CCR § 3, et seq.)

SETTING

The Western MSCC project is proposed for construction adjacent to the existing MSCC facility, located in western Kern County about 40 miles west of Bakersfield, California. The Kern County Fire Department (KCFD) provides fire support services for the MSCC facility and vicinity. Fellows Station 23 is the closest fire station to the proposed Western MSCC facility and would provide initial emergency response to the MSCC facility. It is located about 5 miles east of the project site. The estimated response time to the MSCC facility from Station 23 is about 7 minutes. McKittrick Fire Station 24 would provide back-up support to the facility.

Taft Station 21 will respond to HAZMAT incidents at the MSCC facility The KCFD requested and was granted an aerial ladder truck for high angle and confined space rescue response, as a condition of certification to the La Paloma Generating Company's Facility in western Kern County area. The closest aerial ladder truck in this area would have otherwise been located in Bakersfield. The new truck will be located at Station 21. This station will respond to HAZMAT incidents at a total of five power plant projects that will eventually be located in the area. The La Paloma project owners agreed to provide initial funding for the ladder truck, based on an agreement with the fire department that new power plant facilities proposed for the area would reimburse their proportionate share of the cost as they became certified. As new power plant projects are certified by the Energy Commission they will be required to reimburse the La Poloma project owners based on their share of the costs, as determined by their portion of total megawatts added to the area. The proposed Sunrise, and Elk Hills, projects will thus share the costs of the new aerial ladder truck.

WORKER SAFETY AND FIRE PROTECTION Table 1 provides a description of the equipment and personnel at each fire station.

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

Station	Response time	Equipment[1]	Personnel per shift
Kern County Fire Department Fellows Station 23 100 Broadway Fellows, CA 93224 (661) 768-4341	5 miles east of project site. Estimated response time: 7 minutes	1– Type I Engine 1 – Type 4, FWD watershed Patrol	1 Captain 1 Engineer
Kern County Fire Department McKittrick Station 24 23246 2nd Street McKittrick, CA 93251 (661) 762-7396	9 miles northeast of project site. Estimated response time: 11-12 minutes	2– Type I Engines 1 – Type 4, FWD watershed Patrol	1 Captain 1 Engineer
Kern County Fire Department Taft Station 21 303 10th Street Taft, CA 93268 (661) 765-2155	10 miles southeast of project site. Estimated response time: 14-15 minutes	2– Type I Engines 1 – Type 4, FWD watershed Patrol 1 – (Quint) Aerial Ladder Truck (to be added)	1 Battalion Chief 1 Captain 1 Engineer 1 Firefighter (3 additional personnel per shift to be added with ladder truck)

[1]Equipment types are defined as:

- Type I fire engine is a primary response unit. It has a minimum 400-gallon water tank, a minimum of 1,200 feet of 2 ½ " hose or larger, 200 feet of 1' hose, a 20 to 24 extension ladder and a 500-gpm (gallons per minute) heavy stream appliance. This apparatus also has Basic Life Support (BLS) medical treatment capabilities.
- Type 4 squad is a four-wheel drive (FWD) vehicle used for brush fire or watershed patrol.
- Aerial Ladder Truck is a heavy-duty 85-foot, 1,250 gpm (gallons per minute) Quint-type ladder truck with a 300-gallon water tank. The truck is also a primary response unit.

The Western MSCC project encompasses the construction and operation of a 500 MW natural gas-fired combined cycle power plant, and construction and operation of ancillary facilities, including transmission lines, substations, and pipelines. The facility will incorporate two combustion turbine generators operating in combined cycle mode. Workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

The construction workforce will consist of about 25 workers onsite at project start-up in March 2001, and increase gradually to a peak of about 400 workers in early 2002. The number of construction workers will then gradually decline until project completion. Workers will experience single shift days and a standard 40-hour week, with potential overtime. The project will draw from union shop labor.

The operational workforce will be comprised of five permanent employees that will be hired and trained four to five months prior to project completion.

IMPACTS

PROJECT SPECIFIC IMPACTS

FIRE PROTECTION

Staff reviewed the description of fire protection for the MSCC facility provided in the AFC and supplemental information. The project will rely on both onsite fire protection systems and local fire protection services.

The AFC indicates that fire protection system~~s~~ at the proposed facility would include: 1) a carbon dioxide fire protection system for the combustion turbines; 2) a deluge spray system; 3) fire hydrants and hose stations linked to an underground fire main; 4) sprinkler system; and 5) smoke detectors, combustible gas detectors and fire extinguishers. The underground fire main will be looped to allow water flow from two directions and will be equipped with sectional valves to isolate sections in the event of a break in the water line.

Firewater will be provided from the cooling tower basin with a minimum of 300,000 gallons. It will be pumped by two 100-percent capacity fire pumps, one electric and one diesel powered, with the capacity of 2,500 gpm. Capacity is based upon a minimum of two hours of fire fighting. The pumps will be installed pursuant to NFPA 20. Both pumps will run continuously until manually stopped once activated. A 50-gpm electric pump will maintain firewater pressure in the fixed automatic firewater distribution system.

The new firewater system for the proposed combined cycle expansion will be connected to the existing firewater loop of the existing cogeneration plant. The two firewater loops will be isolated with a normally closed manual valve, and will provide backup as required. Total firewater system demand will be based upon the largest single fire demand for the new plant. The new firewater system will provide 150 to 175-psi minimum pressure. Section 3.4.1.12.1 and 3.4.12.2 of the AFC describe the codes and standards and the design conditions applicable to the fire protection system. A California Registered Fire Protection Engineer will design the fire protection system equipment. The protection systems will be installed and maintained according to applicable NFPA standards.

One new power generation project is under construction in western Kern County. Three additional power plant projects are pending certification by the California Energy Commission. In response to the fire protection services needed to respond to the types of emergency incidents that could occur at these new proposed power plants, Taft Station 21 is acquiring a new 85-foot Quint aerial ladder truck and adding nine new personnel to cover three work shifts per day. The cost of the ladder truck and staffing will be shared as previously indicated. As a condition of certification, the La Paloma Generating Company will reimburse the KCFD for the

purchase of the truck, and one of the 9 staff years. Additionally, annual reimbursements will to be made to a KCFD for a period nine of 15 years for a replacement ladder truck. Shared costs are based upon each project's portion of the total megawatts added to the area. Condition of certification **Worker Safety - 3** addresses this issue and provides that the affected plant owners shall determine their respective obligations.

The applicant will be required to provide final design diagrams and plans for all required fire protection systems to staff and to the KCFD, prior to construction and operation of the project. All Fire Department access roads, water mains, and fire hydrants shall be installed and operational during construction in accordance with Article 87 of the Fire Code. A final inspection by the Fire Department will be required to confirm that the facility meets all the Fire and Building Code requirements.

WORKER SAFETY

Industrial environments are potentially hazardous. Workers may be exposed to chemical spills, hazardous waste, fires, moving equipment, and confined space entry and egress hazards problems. It is important for MSCC to have well-defined policies and procedures, training, as well as effective hazard recognition and control to minimize such hazards and protect workers from unavoidable hazards. MSCC will be responsible for its employees and for assuring that contractors comply with applicable LORS, during construction and operation of all projects related facilities including the transmission lines and pipelines.

Aqueous ammonia will be used onsite in conjunction with a catalyst to control NO_x from the turbines. Aqueous ammonia is 19 percent ammonia water. It evaporates and disperses much slower than anhydrous ammonia in the event of a leak and is much safer than anhydrous ammonia. Storage and handling of ammonia and other hazardous chemicals used onsite is addressed in the Hazardous Materials Management Chapter. Fire suppression systems will be installed on equipment used to handle or store flammable materials, such as natural gas, hydrogen and flammable gas containers.

The proposed health and safety practices and plans proposed by MSCC address construction and ongoing operations, including incidental construction activities, personal protection equipment and fire suppression. These plans and practices provide for a safe work environment and effective fire protection at the MSCC facility.

MITIGATION

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase "Safety and Health Program" to refer to the measures that will be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

CONSTRUCTION SAFETY AND HEALTH PROGRAM

Construction Safety Orders are published at Title 8 of the California Code of Regulations beginning with section 1502 (8 CCR § 1502, et seq.). These requirements are promulgated by Cal/OSHA and are applicable to the construction phase of the project. The Construction Safety and Health Program will include the following:

- Construction Injury and Illness Prevention Program (8 CCR § 1509)
- Construction Fire Protection and Prevention Plan (8 CCR § 1920)
- Personal Protective Equipment Program (8 CCR §§ 1514-1522)

Additional programs under General Industry Safety Orders (8 CCR §§ 3200-6184), Electrical Safety Orders (8 CCR §§2299-2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450-544) will include as necessary:

- Electrical Safety Program
- Unfired Pressure Vessel Safety Orders
- Equipment Safety Program
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Prevention Program
- Scaffolding/Ladder Safety Program
- Articulating Boom Platforms Program
- Crane and Material Handling Program
- Housekeeping and Material Handling and Storage Program
- Hot Work Safety Program
- Respiratory Protection Program
- Employee Exposure Monitoring Program
- Confined Space Entry Program
- Hand and Portable Power Tool Safety Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Hazard Communication Program
- Air Monitoring Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program

During construction, a hazard analysis will be performed to evaluate the hazards and develop appropriate programs/plans to address any hazards that are not included above.

The AFC includes adequate outlines of each of the above programs. Prior to construction activities at the Western MSCC project, detailed programs and plans will be provided to Cal/OSHA and Staff pursuant to the condition of certification **WORKER SAFETY-1.**

OPERATION SAFETY AND HEALTH PROGRAM

Upon completion of construction, existing procedures and policies will be extended to cover activities at the new operating units. Worker safety procedures for new employees will be the same as for existing operations. The Operations Safety and Health Program for the Western MSCC facility will be prepared pursuant to regulatory requirements of Title 8 of the California Code of Regulations. Western MSCC's Operation Safety and Health Program will include the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203)
- Emergency Action Program/Plan (8 CCR § 3220);
- Fire Protection and Prevention Program (8 CCR § 3221); and
- Personal Protective Equipment Program (8 CCR §§ 3401-3411)

Additional programs under General Industry Safety Orders (8 CCR §§ 3200-6184), Electrical Safety Orders (8 CCR §§2299-2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450-544) will include as necessary:

- Motor Vehicle and Heavy Equipment Safety Program
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Protection Program
- Scaffolding/Ladder Safety Program
- Crane and Material Handling Program
- Hazard Communication Program
- Hot Work Safety Program
- Respiratory Protection Program
- Electrical Safety Program
- Confined Space Entry Program
- Hand and Portable Power Tool Safety Program
- Housekeeping and Material Handling and Storage Program
- Hearing Conservation Program

- Back Injury Prevention Program
- Safe Driving Program
- Employee Exposure Monitoring Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program

These plans may require updating if operations change or if new equipment is added.

The AFC includes adequate outlines of each of the above programs. Prior to operation of the Western MSCC facility, detailed programs and plans will be provided to Cal/OSHA and Staff pursuant to the condition of certification **WORKER SAFETY-2.**

SAFETY AND HEALTH PROGRAM ELEMENTS

MSCC provided the proposed outlines for a Construction Safety and Health Program and Operation Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. The major elements required in both Safety and Health Programs are as follows:

INJURY AND ILLNESS PREVENTION PROGRAM (IIPP)

MSCC will submit an expanded Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to construction of the project.

Cal/OSHA will review and provide comments on the IIPP as the result of an onsite consultation at MSCC's request. A Cal/OSHA representative will complete a physical survey of the site, analyze work practices, and assess those practices that may likely result in illness or injury. This on-site consultation will give Cal/OSHA an opportunity to evaluate MSCC's IIPP in conjunction with the activities occurring on site.

EMERGENCY ACTION PLAN

California regulations require an Emergency Action Plan (8 CCR § 3220) which should provide specific procedures to be followed in the event of an emergency situation. Potential emergencies include, but are not limited to, spill or release of hazardous materials, fire, explosion or natural disaster. The plan must include:

- Emergency escape procedures and emergency escape route assignments
- Procedures to be followed by employees who remain to operate critical plant operations before they evacuate
- Procedures to account for all employees after emergency evacuation has been completed
- Rescue and medical duties for employees

- Fire and emergency reporting procedures
- Alarm and communication system
- Contact personnel
- Response procedures for ammonia release (or other hazardous materials)
- Training requirements

Staff proposes condition of certification **WORKER SAFETY-2**, which requires MSCC to submit a final Operation's Emergency Action Plan to Cal/OSHA for review and comment. Staff also proposes that MSCC submit the latest revision to the Emergency Action Plan to the KCFD for review and approval to satisfy proposed conditions of certification **WORKER SAFETY 1** and **2**.

FIRE PREVENTION PLAN

California Code of Regulations requires an Operations Fire Prevention Plan (8 CCR § 3221). The plan will need to include the following topics:

- General requirements
- Fire hazard inventory, including ignition sources and mitigation
- Housekeeping and proper materials storage
- Employee alarm/communication system
- Portable fire extinguishers
- Fixed fire fighting equipment
- Fire control
- Flammable and combustible liquid storage
- Use of flammable and combustible liquids
- Dispensing and disposal of liquids
- Training
- Contact personnel
- Local fire protection services

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

PERSONAL PROTECTIVE EQUIPMENT PROGRAM

California regulations stipulate that Personal Protective Equipment (PPE) and first aid supplies are required whenever hazards are encountered which, due to process, environment, chemicals or mechanical irritants can cause injury or impair bodily

function as a result of absorption, inhalation or physical contact (8 CCR § 3380-3400). MSCC's operational environment will require PPE.

The MSCC program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program. MSCC provided a satisfactory outline that identifies minimum requirements of a proposed MSCC program.

The components of MSCC's program as outlined include:

- Personal Protective Equipment Policy – Presents safety procedures regarding respiratory protection, eye protection, footwear and head protection. It includes the selection of suitable equipment, proper fitting, training, limitations and maintenance.
- Hard Hat Policy – Describes in additional detail the use, inspection and care of hard hats.
- Eye and Face Protection Policy – Describes the requirements for use of approved eye and face protection. It covers numerous types of eye and face protection, respective fit, inspection and care.

Staff evaluated MSCC's PPE policies and assessed that the PPE Program contains the elements that will meet applicable regulations and will significantly reduce the potential impact upon workers.

GENERAL SAFETY

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices".

Safety Action Plan for Contractors

This is a guide for contractors to follow in developing their individual safety programs as required by Cal/OSHA.

Confined Space Entry

The California Code of Regulations identifies the minimal standards for preventing employee exposure to dangerous air contaminants and/or oxygen deficiency in confined spaces, where there is an oxygen-deficient atmosphere, a limited means of egress, or a source of toxic of flammable contaminants (8 CCR Sections 5156-5168). Confined spaces include silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins and pits. MSCC's confined space entry procedures must include:

- Air monitoring and ventilation requirements
- Rescue procedures
- Lock-out / tag-out and blocking, blinding, and blanking requirements
- Permit completion
- Training

Tailgate Briefings Procedure

This procedure defines consistent format for conducting tailgate meetings that focus on work procedures necessary to safely and efficiently accomplish the job, including identifying and eliminating potential hazards to employees.

Plant Safety Committee

The Committee provides employees an opportunity to identify safety problems and recommend appropriate hazard controls to the Plant Manager. The Committee is designed to enable the employees to actively participate in various phases of the safety program, and to utilize their knowledge and experience in formulating recommendations and safety program objectives.

Hazard Communication Program

The Hazard Communications Standard establishes an employee's right to know about chemical hazards in the workplace. In accordance with federal and State requirements, the Hazard Communication Manual for MSCC should provide information about hazardous substances and their control through a comprehensive Hazard Communication Program, which includes:

- Preparing and maintaining hazardous materials inventory list
- Providing material safety data sheets
- Training employees
- Labeling containers
- Informing employees about hazardous nonroutine tasks
- Informing contractors about potential hazards and necessary precautions

CUMULATIVE IMPACTS

The construction and operation of the Western MSCC project could result in impacts to the fire and emergency service capabilities of the KCFD. Staff has discussed with the KCFD the fire protection equipment and services required for the facility. KCFD representatives are discussing shared costs with MSCC of the aerial ladder truck and payback schedules associated with the proposed project, as well as reimbursement of staffing costs. Based on discussions with the KCFD it is staff's belief that any cumulative impact from the project will be mitigated by the proposed measures.

FACILITY CLOSURE

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

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

If MSCC complies with staff's conditions of certification **WORKER SAFETY - 1, and - 2,** and provides assurance that fire protection impacts have been mitigated, as required by conditions of certification **WORKER SAFETY- 3**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety, 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 MSCC will be reviewed by the appropriate agencies before implementation. The proposed conditions will also assure mitigation of impacts to fire protection services. 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

WORKER SAFETY-1 The project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program, containing the following:

- a Construction Injury and Illness Prevention Program
- a Construction Fire Protection and Prevention Plan
- a 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 Kern County Fire Department (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, with a copy of the cover letter to Cal/OSHA's Consultation Service. The project owner shall provide a letter from the KCFD stating that they have reviewed and accepted the Construction Fire Protection and Prevention Plan.

WORKER SAFETY– 2 the project owner shall submit to the CPM a copy of the Project Operation Safety and Health Program containing the following:

- an Operation Injury and Illness Prevention Plan
- an Emergency Action Plan
- an Operation Fire Protection Plan
- a 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 with a copy of the cover letter to the Cal/OSHA's Consultation Services, and Kern County Fire Department 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.

WORKER SAFETY– 3 The project owner shall reach an agreement with the Kern County Fire Department (KCFD) regarding shared costs on the fees and payment of those fees for the heavy duty 85-foot 1,250 gpm Quint-type ladder truck with 300-gallon water tank. Staffing of personnel for the truck, and annual payment to the 15-year fund for purchase of a new replacement ladder truck, or other alternative measures agreeable to KCFD.

Protocol: The project owner shall meet with representatives of the Kern County Fire Department to reach an agreement on the following shared costs:

a. shared costs of a heavy duty 85-foot 1,250 gpm Quint-type ladder truck with 300-gallon water tank;
b. annual payments to 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. a one-time payment to the Kern County Fire Department to cover the costs of nine new personnel for one year to cover three shifts per day for the new ladder truck

Should the Sunrise and/or Elk Hills projects not be certified by the Energy Commission, the shared coasts specified in a) through c) will be distributed among those projects in the vicinity that have been certified.

Verification: Not later than 30 days prior to any site mobilization, the project owner shall provide the CPM with a copy of an agreement between the Kern County Fire Department and the project owners of Sunrise Power Project, La Paloma Generating Project, and Elk Hills Power Project relative to the agreed-upon fees and payment for the heavy duty 85-foot 1,250 gpm Quint-type ladder truck, staffing, and the 15-year ladder truck replacement fund.

REFERENCES

Cal/OSHA Consultation. 1990. Cal/OSHA Consultation Pamphlet.

Kern County Fire Department. 2000. Personal communications between Fire Chief P. Castle and K. Hann regarding review of AFC fire protection plan, May 11, 2000.

Kern County Fire Department. 2000. Personal communications between Fire Chief P. Castle and K. Hann regarding review of existing fire equipment and capabilities, May 25, 2000.

Kern County Fire Department website on the Internet: www.co.kern.ca.us/fire/

Midway Sunset Cogeneration Company. 1999. Application for Certification for the Western Midway Sunset Cogeneration Company Project (99-AFC-9) prepared by WZI Inc. Submitted to the California Energy Commission, December 22, 1999.

Midway Sunset Cogeneration Company. 2000. Application for Certification for the Western Midway Sunset Cogeneration Company Project, Supplemental Information in Response to Data Adequacy Worksheets (99-AFC-9) prepared by WZI Inc. Submitted to the California Energy Commission, February 8, 2000.

Midway Sunset Cogeneration Company. 2000. Application for Certification for the Western Midway Sunset Cogeneration Company Project, Supplemental Information #2 (99-AFC-9), prepared by WZI Inc. Submitted to the California Energy Commission, February 29, 2000.

Midway Sunset Cogeneration Company. 2000. Application for Certification for the Western Midway Sunset Cogeneration Company Project, Data Request Responses #2 (99-AFC-9) prepared by WZI Inc. Submitted to the California Energy Commission, May 4, 2000.

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

INTRODUCTION

The transmission line for the proposed Western Midway Sunset Cogeneration Company Project (Western MSCC), is a single-circuit overhead 230 kV line connecting the facility's switchyard to the Pacific Gas and Electric (PG&E) electrical transmission system. Connection to the PG&E system will be made at the existing PG&E Midway Substation near Buttonwillow, 19 miles from the facility. The proposed route lies within the existing Midway Sunset Cogeneration Company's (MSCC) corridor in which is presently located an MSCC 230 kV transmission line. This line connects the existing MSCC facility to the same PG&E Midway Substation (Midway 1999a, pages 1-4, 3.6-2, and 4.2-1). Since the proposed line is within the PG&E service area, it will be designed according to existing PG&E guidelines and construction practices reflecting compliance with applicable laws, ordinances, regulations and standards (LORS). The purpose of this analysis is to assess the proposed construction and operational plan for incorporation of the measures necessary for such compliance. If compliance is established, staff will recommend approval of the line with respect to the issues of concern; if not, staff will recommend revisions as appropriate.

Staff's analysis will focus on issues, which relate primarily to the physical presence of the line, or secondarily to the physical interactions of line electric and magnetic fields.

- Aviation safety;
- Interference with radio-frequency communication;
- Audible noise;
- Fire hazards;
- Hazardous shocks;
- Nuisance shocks; and
- Electric and magnetic field (EMF) exposure.

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 project. The impacts of concern are addressed through specific federal or state regulations or through established industry standards and practices. Presently there are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above.

AVIATION SAFETY

Any hazard to area aircraft relates to the potential for collision with the line in the navigable air space. The applicable federal LORS as discussed below are intended to ensure the distance and visibility necessary to avoid such collisions.

FEDERAL

- Title 14, Part 77 of the Federal Code of Regulations (CFR), "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. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.
- FAA Advisory Circular (AC) 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.
- FAA AC No. 70/460-1G, "Obstruction Marking and Lighting". This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

Transmission line-related radio-frequency interference is one of the indirect effects of line operation produced by the physical interactions of line electric fields. The level of such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts could be assessed from field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

FEDERAL

- Federal Communications Commission (FCC) regulations in Title 47 CFR, 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 generated, such noise manifests as perceivable interference with radio or television signal reception or interference

with other forms of radio communication. Since the level of interference depends 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, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement.

STATE

- General Order 52 (GO-52), California Public Utilities Commission (CPUC). 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. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

AUDIBLE NOISE

INDUSTRY STANDARDS

There are no design-specific federal regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design and maintenance standards established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All high-voltage lines are designed to assure compliance. Such noise usually results 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. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet weather and from lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345 kV such as the proposed line. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way.

NUISANCE SHOCKS

INDUSTRY STANDARDS

There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For modern high-voltage lines, such shocks are effectively minimized industry wide 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). Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields.

As with lines of the type proposed, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

FIRE HAZARDS

The fire hazards addressed through the following 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 and other combustible objects.

STATE

- General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction” specifies tree-trimming criteria to minimize the potential for power line-related fires.
- Title 14 Section 1250 of the California Code of Regulations, “Fire Prevention Standards for Electric Utilities” specifies utility-related measures for fire prevention.

HAZARDOUS SHOCKS

The hazardous shocks that are addressed by the following regulations and standards are those that could result from direct or indirect contact between an 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.

STATE

- GO-95, CPUC. “Rules for Overhead Line Construction”. These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and line workers.
- Title 8, CCR, Section 2700 et seq., “High Voltage Electric Safety Orders”. These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.

INDUSTRIAL STANDARDS

There are no design-specific federal regulations to prevent hazardous shocks from power lines. Safety is assured industry wide through compliance with the requirements in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line.

ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE

The possibility of deleterious health effects from electric and magnetic field exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of considering related exposures together as EMF exposure. As noted by the applicant (Midway 1999a, pages 5.16-11 and 5.16-12), the available evidence has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, to note 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. Therefore, staff considers it appropriate, in light of present uncertainty, to reduce such fields to some degree, where feasible, until the issue is better understood. The challenge has been to establish when, and how far to reduce them.

While there is considerable uncertainty about the EMF/health effects issue, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns relate to the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency and maintainability, depending on the type and extent of such measures.

STATE

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only with respect to new or modified lines. It required each utility within its jurisdiction to establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength

or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This PUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, staff requires evidence that each proposed line will be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability efficiency and maintainability. It is therefore, up to each applicant to ensure that such measures are applied in ways, and to an extent, without significant impacts on line operation. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Such field strengths can be estimated for any given design, using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, their fields are required under existing CPUC policies to be similar to fields from similar lines in that service area. A condition of certification is usually proposed by staff to ensure implementation of the reduction measures necessary. The applicable condition for this project is TLSN-1.

INDUSTRIAL STANDARDS

No federal regulations have been established specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF issue.

In the face of the present health uncertainty, several states have opted for design-driven regulations ensuring that fields from new lines are generally similar to those from existing lines. Some states (Florida, Minnesota, New Jersey, New York, Montana) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

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 can manifest as the previously noted radio noise, audible noise and nuisance shocks. Therefore, designs were aimed industry wide, at

reducing the strengths of the electric fields. The present focus is on the magnetic field because only it can penetrate building materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible transmission and other high-voltage power lines, staff considers it important for perspective, to note that an 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 of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than the power line environment.

SETTING

The route for the proposed line as discussed in more details by the applicant (Midway Sunset 1999a, pages 3.6-2, 5.9-15 and 5.9-16), will traverse areas that are undeveloped, modified from oil production activities, or irrigated for agriculture. The entire 19-mile route will run within the applicant's 230 kV-line corridor established with respect to their existing Midway Sunset Cogeneration Company (MSCC) facility (Midway 1999a, page 3.6-4). Such use of existing line corridors (to locate new ones) is in keeping with state policy on the routing of transmission lines. The Energy Commission facilitated compliance by requiring the applicant on June 22, 1988 to obtain an adequate right-of-way to accommodate both the line for their cogeneration project and the one for a future project such as this.

As noted by the applicant (Midway 1999a, pages 5.9-15 and 6.9-16) the route passes within 0.6 miles east of McKittrick and within 0.5 miles to the south of the town of Buttonwillow. The nearest residences along the route are located within 0.25 miles from the line. There are 14 such residences. No residential developments are proposed for the area within one half mile from the route.

PROJECT DESCRIPTION

According to information from the applicant (Midway 1999a, pages 3.6-1 through 3.6-4, and pages 3.11-9 through 3.11-11), the proposed transmission line will be made up of the two components listed below.

- The single-circuit 230 kV overhead line extending approximately 19 miles from the project site to the existing PG&E Midway Substation near Buttonwillow.
- A new, 230 kV project-specific switchyard at the project site.

The line will be supported on single-shaft tubular steel poles. Each will be designed to provide a ground clearance of at least 30 feet. The applicant (Midway 1999a, Appendices F1 and F2) has provided details of these structures. Construction and operation will be according to PG&E standards and practices reflecting compliance with existing LORS.

IMPACTS

GENERAL IMPACTS

LORS section, GO-95 and Title 8, CCR Section 2700 et seq. provide the minimum regulatory requirements necessary to avoid the direct or indirect contact previously discussed in connection with hazardous shocks and aviation hazards. Of secondary concern are the field-related impacts manifesting as nuisance shocks, radio noise, communications interference and magnetic field exposure. The relative magnitude of such impacts would be reflected in the field strengths characteristic of a given line design. Since the field-reducing measures can affect line operations, the extent of their implementation together with related field strengths, will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. They will therefore, vary from one service area to the other according to prevailing conditions. It would be up to each project proponent to apply such measures to the extent appropriate for the geographic area involved. The potential for all these impacts is assessed separately for each proposed project

PROJECT SPECIFIC IMPACTS

AVIATION SAFETY

There are no major airports in the vicinity of the proposed project. The nearest airport with regularly scheduled commercial flights is in Bakersfield, approximately 45 miles to the northeast The Taft Airport is approximately 14 miles to the southeast (Midway 1999a, pages 4.1). An FAA “Notice of Construction or Alteration” will not be required for the proposed power line, according to existing regulatory criteria. However, the applicant will (as is general practice with all transmission lines) file this notice with the FAA. From its consideration of all issues related to distance from the line and FAA safety requirements, staff is in agreement with the applicant that the proposed line (which will run parallel to existing or proposed lines will not pose a significant hazard to area aviation. The line’s minimum ground clearance of 30 feet (Midway 1999a, pages 3.6-3 and 4.2-1) should be adequate for the safe operation of any aircraft involved in agricultural operations.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

The previously noted corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware and other irregularities around the conductor surface. The applicant intends to use maintenance crews to minimize the potential for such corona impacts (Midway 1999a, pages 3.9-3). The potential for such interference is usually of concern only for lines of 345 kV and above and not this 230 kV line. However, if such corona noise were to be generated, no interference-related complaints would be expected given the general absence of residences immediately near the project. The previously noted 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 affected individual. The

applicant who intends to ensure compliance (Midway Sunset 1999a, page 4.2-3), noted this requirement. Staff has proposed a condition of certification **(TLSN-2)** in this regard. **TLSN-1** is also proposed by staff to ensure compliance with GO-52, also intended to prevent radio interference.

AUDIBLE NOISE

As with radio noise, the line's low-corona design will minimize the potential for corona-related audible noise. This means, as noted by the applicant (Midway Sunset 1999a, pages 4.2-2 and 4.2-3), that the line will not add significantly to existing background noise levels in the area. 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 **Noise** section.

FIRE HAZARDS

As is current PG&E policy, adequate fire prevention and suppression measures will be implemented in the area around the proposed line as required by related regulations and industry practices. Compliance with G-O 95 requirements will ensure the clearance necessary to prevent fires from direct contact between the proposed line, trees and other objects. Staff has proposed a specific condition of certification, **TLSN-4,** to prevent accumulation of combustible materials that could contribute to such fires.

HAZARDOUS SHOCKS

As noted by the applicant (Midway 1999a, page 3.6-3), the proposed line will be constructed (as is present PG&E practice) according to the requirements of GO-95 which prevent hazardous shocks from direct or indirect human contact with an overhead, energized line. Therefore, staff does not expect these lines to pose any such hazards to humans and recommends condition of certification **TLSN-1** to ensure implementation of the GO-95-related measures.

NUISANCE SHOCKS

As with current PG&E practice, the potential for nuisance shocks will be minimized in the line area through standard grounding procedures. Ensuring GO-95-required ground clearance, together with field strength reducing designs as intended, will minimize the potential for the electrical charging for which such grounding would be necessary. Staff recommends condition for certification, **TLSN-5** to ensure the grounding necessary.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

The applicant calculated the maximum field strengths along the route of the proposed line, from the project's switchyard to the interconnection point at the PG&E Midway Switchyard. The electric field intensity as calculated for the point of maximum field strength within the right of way is 3.23 kV/m (Midway 1999a, page 5.16-11). Field strength calculations were also made for each edge of the 200-ft right-of-way to reflect the contribution of the proposed and other area lines to background levels outside the right-of-way (Midway 1999a, pages 3.6-5 through 3.6-8). These contributing lines include the applicant's existing 230 kV line, PG&E's

115 kV line serving the Midway Sunset oil fields, the 230 kV line for the proposed La Paloma facility, and PG&E's Diablo-500 kV line. Results of this calculation (Midway 1999a, page 3.6-7) show the maximum electric field strength of the proposed line itself as 0.114 kV/m at the left edge of the right-of-way and 0.837 at the right edge of the right-of-way. Background field strengths at the same right-of-way locations (as derived from the applicant's existing 230 kV line) are 1.471 kV/m and 0.086 kV/m, respectively, reflecting field intensities typical of such lines in the PG&E service area.

Field strengths within and outside the right-of-way reflect the interaction of fields from the proposed line and nearby lines. The applicant has assessed the proposed line's contribution to field intensities along the route by calculating electric field strengths at various points of interaction with fields from existing or proposed lines. The applicant's calculations show that the presence of the proposed line would lead to field strength values of between 0.733 kV/m and 1.435 kV/m, at both edges of the right-of way. This would translate into electric field strengths increases of between 0.647 kV/m and 0.758 at the right edge of the right-of-way, and decreases of between 0.36 kV/m and 0.89 kV/m at the left edge. These resulting field strengths are similar for the edges of the right-of-way of PG&E lines of the same voltage. Staff regards these net field changes as insignificant with respect to the previously noted electric field effects since they are within normal background levels of 1.0 kV/m or less.

As with electric fields, total magnetic field levels at the edge of the 200-foot right-of-way would increase or decrease when all existing or proposed area lines are operating together with the proposed line. As calculated by the applicant, the maximum magnetic field from the proposed line alone would be 107.87 mG at the right edge of the right-of-way and 58.28 at the left edge. This would be within the levels expected for lines of similar design and voltage-carrying capacity in the PG&E service area. Addition of fields from the proposed line would produce field intensities of between 44.44 mG and 101.70 mG at the edges of the right-of-way. As with the applicant's existing 230 kV line, these fields are similar in intensity (at these edges of the right-of-way) to fields from similar lines in the PG&E service area. Their additions would lead to increases (over existing levels) of between 43.9 mG and 95.35 mG at the left edge of the right-of-way while causing decreases of between 2.16 mG and 4.22 mG at the left edge. These increases are, as staff would expect from addition of a line of the voltage and current-carrying capacity proposed.

Staff has verified the accuracy of the applicant's calculations with respect to parameters bearing on field strength, dissipation, and exposure assessment. Staff has recommended condition of certification **TLSN-3** to verify that the fields are reduced to the extent expected by the applicant for their chosen field-reducing design.

Since no residences are expected within the proposed line corridor, measurements at the edges of the right-of-way are significant in marking the starting point of any of the long-term residential exposures at the root of the present health concern. Since the fields from the proposed line are of the same intensity as fields from similar

PG&E lines, any exposures beyond the edge of this right-of-way (whether at the previously noted 14 residences) or any future area residences, would be similar to exposures possible from any such lines in the PG&E service area. Maintaining such exposures within those associated with existing lines (while ensuring safety, efficiency, reliability and maintainabilty) reflects compliance with existing LORS.

CUMULATIVE IMPACTS

Since the strengths of electric and magnetic fields from the proposed and similar lines are calculated to factor the interactive effects of fields from nearby lines, the values calculated for the proposed line reflect any cumulative exposures along the route at locations of possible long-term magnetic field exposure. As shown by the calculated values, any such exposures would be within the levels associated with lines within the PG&E transmission system.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for lines such as proposed for this project, the public health significance of any project-related field exposure cannot be characterized with certainty. What is clear with respect to the proposed line is that any field exposures would be within the range associated with similar PG&E lines as reflected in present CPUC policy. The potential for nuisance shocks will be minimized through grounding and other field-reducing measures to be implemented by the applicant in keeping with PG&E practices. Such planned implementation reflects compliance with GO-95 and Title 8, Section 2700 et seq. of the California Code of Regulations. Since the line will be located away from all area airports, any hazard to area aviation will be minimal. The use of low-corona line design as well as implementation of an appropriate line maintenance program will minimize the potential for corona noise and its related interference with radio-frequency communication.

RECOMMENDATIONS

Since the proposed 230 kV transmission line will be designed according to the applicable safety and field-reducing guidelines, and located within the corridor of an existing MSCC line corridor, staff recommends approval with specific regard to the line-related impacts of concern in this analysis. If such approval is granted, staff recommends that the Commission adopt the following conditions of certification to ensure implementation of the measures necessary to achieve the safety and field reduction levels assumed by the applicant for the proposed line design.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed transmission line according to the requirements of CPUC's GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

Verification: Thirty days before the start of T-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 line will be constructed according to the requirements GO-95, GO 52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

TLSN-2 The project owner shall ensure that every reasonable effort will be made to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from operation of the project-related lines and associated switchyards.

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 for the project-related lines and included during the first five years of plant operation in the Annual Compliance Report.

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields from the line before and after they are energized. Measurements should be made at representative points along the edge of the right-of-way for which field strength estimates were provided.

Verification: The project owner shall file copies of the pre-and post-energization measurements with the CPM within 60 days after completion of the measurements.

TLSN-4 The project owner shall ensure that the right-of-way of the project-related lines are kept free of combustible material, as required under the provisions of Section 4292 of the Public Resources Code and Section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way and provide such summaries in the Annual Compliance Report.

TLSN-5 The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards regardless of ownership.

In the event of a refusal by any 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 30 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

Midway (Western Midway Co) 1999a. Application for Certification (AFC), Volumes I, II, and III. Submitted to the California Energy Commission on December 22, 1999.

Midway (Western Midway Sunset Co) 2000a. Supplemental AFC Material in Response to Data Adequacy Worksheets. Submitted to the California Energy Commission on February 9, 2000.

National Institute of Environmental Health Services 1998. An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. A Working Group Report, August, 1998.

HAZARDOUS MATERIALS MANAGEMENT

Testimony of Rick Tyler

INTRODUCTION

The purpose of this analysis is to determine if the proposed Western Midway Sunset Cogeneration Company Project (Western MSCC) will result in the potential for a significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and thus employees accept a higher level of risk than the general public as a condition of employment. Workers are thus not afforded the same level of protection normally provided to the public. Further, workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials (see staff's **Worker Safety and Fire Protection** analysis).

The only hazardous material proposed for use at the Western MSCC project site in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), is aqueous ammonia. The choice to use aqueous ammonia significantly reduces the risk that would be associated with use of the more economical anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at elevated pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release which can rapidly introduce large quantities of the material to the ambient air, where it can be transported in the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are also much easier to contain than those associated with the anhydrous form. In addition, relatively slow mass transfer from the free surface of the spilled aqueous solution limits emissions from a spill of aqueous ammonia. In addition to use of the aqueous form, the MSCC is also proposing to use a 19 percent solution of ammonia instead of the more typical 28 percent solution. This significantly reduces the vapor pressure of the solution thus further reducing the emission rate from the surface of any spilled material.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, will be present at the proposed facility. However, these materials pose no significant potential for off-site impacts as a result of the quantities on-site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project will also involve the construction and operation of a natural-gas pipeline and handling of large amounts of natural gas. Natural gas poses some risk of both fire and

explosion. The Western MSCC project will also require the transportation of aqueous ammonia to the facility. Analysis of the potential for impact associated with such deliveries is addressed in staff's **Traffic and Transportation** analysis.

LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES

The following federal, state, and local laws and policies generally apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

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 extremely hazardous materials. The SARA Act (codified in 40 C. F. R., § 68.110 et seq.) requires 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 are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

The California Health and Safety Code, section 25534, directs facility owners, storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with 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. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP).

Title 8, California Code of Regulations, Section 5189, requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

Title 8, California Code of Regulations, Section 458 and Sections 500 – 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer anhydrous ammonia. These sections generally codify the requirements of several industry codes, including the ASME Pressure Vessel Code, ANSI K61.1 and the National Boiler and Pressure Vessel Inspection Code. While these codes apply to anhydrous ammonia, they may also be used to design storage facilities for aqueous ammonia.

California 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 causes 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 to business or property."

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. The latest revision to Article 80 was in 1997 (UFC, 1997). These articles contain minimum setback requirements for outdoor storage of ammonia.

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official (CBO) must inspect and verify compliance with these requirements prior to issuance of an occupancy permit. A further discussion of these requirements is provided in the **Facility Design** portion of this document.

SETTING

SITE AND VICINITY DESCRIPTION

Several factors associated with the area in which a project is to be located affect its potential to cause public health impacts from an accidental release of a hazardous material. These include:

- The local meteorology,
- Terrain characteristics, and
- The location of population centers and sensitive receptors relative to the project.

Staff considered these factors, as discussed below, in assessing the potential public health impacts of the project.

METEOROLOGICAL CONDITIONS

Meteorological conditions, including 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 risks. When wind speeds are low and the atmosphere is stable, dispersion is severely reduced and can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the air quality section of the AFC (MSCC, 1999a, AFC Chapter 5.2). This data indicates that low wind speeds and temperatures exceeding 100°F can occur in the project area. Therefore, staff suggests the use of F stability (stagnated air, very little mixing), one

meter/second wind speed and an ambient temperature of 100° F in its modeling analysis of an accidental release to reflect worst case atmospheric conditions. MSCC chose to use EPA default modeling to estimate maximum potential for impact. This method utilizes a wind speed of 3.4 miles per hour, F stability and the highest daily temperature recorded in the last three years. Staff believes that this method produces very conservative results that over estimate the potential worst case impacts associated with an accidental ammonia release.

TERRAIN CHARACTERISTICS

The location of elevated terrain (terrain above the power plant 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. The principal risk of accidental release at this facility is associated with aqueous ammonia. However, modeling of an accidental release of aqueous ammonia indicates that significant concentrations would be confined to the immediate project area. Thus, elevated terrain is not an important factor effecting the modeled results for this project.

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses (Calabrese 1978). Also, the location of the population in the area surrounding a project site may have a large bearing on health risk. There are no sensitive receptors near the project and the nearest residence is more than 8000 feet from the proposed facility (MSCC, 1999a, Map 5.16-2).

IMPACTS

The Energy Commission staff has determined that aqueous ammonia and natural gas are the only hazardous materials to be handled that pose a risk of off-site impacts. The following is a project specific analysis of the potential impacts associated with the handling of each of these materials.

AQUEOUS AMMONIA

Aqueous ammonia will be used in controlling the emission of oxides of nitrogen (NOx) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in hazardous down-wind concentrations of ammonia gas.

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 200 ppm, which is also the RMP level 1 criterion used by EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on

the public for a one-time exposure of 75 ppm. (A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis.) If the exposure associated with a potential release would exceed 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff may also assess the probability of occurrence of the release and/or the nature of the potentially exposed population. Based on such analysis, staff may determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

Section 5.15 of the AFC included modeling of potential impacts associated with a worst case accidental release of aqueous ammonia based on EPA default modeling protocols. The worst-case release scenario is associated with a postulated spontaneous catastrophic storage tank failure and release of its entire contents. In conducting this analysis, it was assumed that winds of 1.5 meters per second and category F stability would exist at the time of the accidental release. This screening analysis was designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport. This analysis indicates that concentrations exceeding 200 PPM would be confined to a distance of about .31 miles (1636 feet) in the event of a worst case accident. The nearest residence is more than 8000 feet from the facility. Staff does not believe that concentrations exceeding 75 PPM would extend to a distance of 8000 feet in the event of a worst case accident. Based on this analysis the project would not pose a risk of significant impact in the event of an accidental ammonia release.

NATURAL GAS

Natural gas, which will be used as a fuel by the project, 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 from natural gas can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) Code 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 gas fired equipment. Additionally, start-up procedures will require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture.

CUMULATIVE IMPACTS

As proposed, the facility will cause no significant risk of off-site impacts. Thus the direct impacts of the project will not add to any existing accidental release risks.

FACILITY CLOSURE

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site regardless of when facility closure occurs. Therefore, the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the

facility owner abandons the facility in a manner which poses a risk to surrounding populations, staff will coordinate with the California Office of Emergency Services, Kern County Department of Environmental Health, and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible parties (O.E.S. 1990).

MITIGATION

Staff has determined that the proposed mitigation for the Western MSCC project is adequate to reduce the potential frisk of public health impacts associated with accidental hazardous materials accidents to insignificant levels. However, staff proposes a condition requiring development of a safety management plan for delivery of aqueous ammonia. The Western MSCC project will not be required to develop and implement a Process Safety Plan pursuant to Title 8. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures associated with the project. Such a plan will also reduce the risk to workers.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use will pose no potential for significant impacts on the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations and standards (LORS). In response to Health and Safety Code, section 25531 et seq., the applicant will be required to develop an RMP. To insure adequacy of the RMP, staff 's proposed conditions of certification require that the RMP be submitted for concurrent review by the Kern County Department of Environmental Health and staff. In addition, staff's proposed conditions of certification also require Kern County's acceptance of the RMP and staff's approval of the RMP prior to delivery of any hazardous materials to the facility. With adoption of staff's proposed conditions of certification, the project will also comply with Health and Safety Code, section 41700, and it will not pose any potential for significant impacts to the public from hazardous materials releases.

RECOMMENDATION

Staff recommends the Energy Commission impose the proposed conditions of certification, presented herein, to ensure that the project is designed, constructed and operated to comply with applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release.

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous material in reportable quantities, as specified in Title 40, C. F.R. Part 355, Subpart J, section 355.50, not listed in Appendix B, below, or in greater quantities than those identified by chemical name in Appendix B, below, unless approved in advance by the CPM.

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

HAZ-2 The project owner shall develop and implement a safety management plan for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist.

Verification: At least sixty days prior to the delivery of aqueous ammonia to the MSCC facility, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

HAZ-3 The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 150% of the storage volume plus the volume associated with 24 hours of rain assuming 25 year storm.

Verification: At least 60 days prior to delivery of aqueous ammonia to the MSCC facility, the project owner shall submit final design drawings and specifications for the ammonia storage tank and secondary containment basins to the CPM for review and approval.

REFERENCES

AIChE (American Institute of Chemical Engineers). 1989. Guidelines For Technical Management of Chemical Process Safety, AIChE, New York, NY 10017.

AIChE (American Institute of Chemical Engineers). 1994. Guidelines For Implementing Process Safety Management Systems, AIChE, New York, NY 10017.

API (American Petroleum Institute). 1990. Management of Process Hazards, API Recommended Practice 750; American Petroleum Institute, First Edition, Washington, DC, 1990.

Baumeister, T. and L.E. Marks. 1967. Standard Handbook for Mechanical Engineers; McGraw-Hill, New York, NY. (Tables 24 and 43).

Calabrese, E.J. 1978. Pollutants and High Risk Groups. John Wiley and Sons, New York.

EPA (Environmental Protection Agency). 1987. Technical Guidance for Hazards Analysis, Environmental Protection Agency, Washington, DC, 1987.

EPA (Environmental Protection Agency). 1988. Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Environmental Protection Agency, Research Triangle Park, NC, 1988.

FEMA (Federal Emergency Management Agency). 1989. Handbook of Chemical Hazard Analysis Procedures, Federal Emergency Management Agency, Washington, DC, 1989.

Lees, F.P. 1998). Loss Prevention in the Process Industries, Vols. I, II and III. Second Edition, Butterworths.

NFPA (National Fire Protection Association). 1987. NFPA 85A, Prevention of Furnace Explosions in Fuel Oil and Natural Gas Fired Single Burner Boiler Furnaces, National Fire Protection Association, Batterymarch Park, Quincy, MA, 1987.

NRC (National Research Council). 1979. Ammonia. Subcommittee on Ammonia. Committee on Medical and Biologic Effects of Environmental Pollutants. Division of Medical Sciences, Assembly of Life Sciences, National Research Council (NRC), Baltimore, Maryland, University Park Press (NTIS No. PB 278-027).

MSCC (Midway Sunset Cogeneration Company) 1999. Application for Certification, Western Midway Sunset Cogeneration Company Project (99-AFC-9). Submitted to the California Energy Commission , December 22, 1999.

Perry. 1973. Perry's Chemical Engineers' Handbook, Sixth Edition, McGraw-Hill, USA.

USOSHA (United States Occupational Safety and Health Administration). 1993. Process Safety Management / Process Safety Management Guidelines For Compliance. U.S. Department of Labor, Washington, DC.

BASIS FOR STAFF'S 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 authority to require 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 healthy adult 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 for 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..HAZARDOUS MATERIAL MANAGEMENT

APPENDIX A TABLE 1

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 late 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.

REFERENCES

EPA, 1987, U.S. Environmental Protection Agency, Technical Guidance for Hazards Analysis, EPA, Washington, D.C.

NRC, 1985, National Research Council, Criteria and Methods for Preparing Emergency Exposure Guidance Levels (EEGL), Short-Term Public Emergency Guidance Level (SPEGL), and Continuous Exposure Guidance Level (CEGL) Documents, NRC, Washington, D.C.

NRC, 1972, Guideline for Short-Term Exposure of The Public To Air Pollutants. IV. Guide for Ammonia, NRC, Washington, D.C.

AIHA, 1989, American Industrial Hygienists Association, Emergency Response Planning Guideline, Ammonia, (and Preface) AIHA, Akron, OH.

NIOSH, 1994, National Institute of Occupational Safety and Health, Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Washington D.C., Publication number 94-116.

WHO, 1986, World health Organization, Environmental Health Criteria 54, Ammonia, WHO, Geneva, Switzerland.

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 Safety and Health
NRC, National Research Council
STEL, Short Term Exposure Limit
STPEL, Short Term Public Emergency Limit
TLV, Threshold Limit Value
WHO, World Health Organization

HAZARDOUS MATERIAL MANAGEMENT
Appendix B

[Insert here Table 5.15 from the AFC (MSCC, 1999a)]

WASTE MANAGEMENT

Testimony of Michael Ringer

INTRODUCTION

This section analyzes potential issues associated with managing wastes generated from constructing and operating the Western Midway Sunset Cogeneration Project (Western MSCC). It evaluates the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and non-hazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation, except wastewater. These are discussed in the Soil and Water Resources section of this document.

Energy Commission staff's primary concerns in its waste management analysis are to ensure that:

- The management of the wastes will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during constructing and operating the proposed project will be managed in an environmentally safe manner; and
- Disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

RESOURCE CONSERVATION AND RECOVERY ACT (42 U.S.C. SECTION 6921 ET SEQ.)

The Resource Conservation and Recovery Act (RCRA) establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding:

- record keeping practices which identify quantities of hazardous wastes generated and their disposition,
- labeling practices and use of appropriate containers,
- use of a manifest system for transportation to permitted treatment, storage, or disposal facilities, and
- submission of periodic reports to the U.S. Environmental Protection Agency (EPA) or authorized state agency.

TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260

These sections contain regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity. Specific types of wastes are also listed.

STATE

CALIFORNIA HEALTH AND SAFETY CODE, SECTION 25100 ET SEQ. (HAZARDOUS WASTE CONTROL ACT OF 1972, AS AMENDED).

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control under the California Environmental Protection Agency, or Cal EPA) 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 Cal EPA and creates a manifest system to be used when transporting such wastes.

TITLE 14, CALIFORNIA CODE OF REGULATIONS, SECTION 17200 ET SEQ. (MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL)

These regulations set forth minimum standards for solid waste handling and disposal guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

TITLE 22, CALIFORNIA CODE OF REGULATIONS, SECTION 66262.10 ET SEQ. (GENERATOR STANDARDS)

These sections establish requirements for generators of hazardous waste. Waste generators must determine if their wastes are hazardous according to specified characteristics or lists of hazardous wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, generators must use registered hazardous waste transporters for any offsite shipments. Requirements are also established for record keeping, reporting, packaging, and labeling of hazardous wastes, use of containers and tanks for hazardous waste storage, and limiting the amount of time that hazardous waste can be stored onsite.

LOCAL

KERN COUNTY GENERAL PLAN PUBLIC FACILITIES ELEMENT

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).

SETTING

PROJECT AND SITE DESCRIPTION

The Western MSCC project is proposed to be located on approximately 10 acres located immediately adjacent to the existing MSCC site in western Kern County, about 40 miles west of Bakersfield. The project includes a new 19 mile transmission line that will be constructed parallel to and within the existing corridor that connects the existing MSCC plant with the Midway Substation located east of Buttonwillow. The route crosses approximately 4.0 miles of land that has been modified by oil production activity, 10.8 miles of undeveloped land, and 4.2 miles of irrigated agriculture land (MSCC 1999a, AFC p. 3.6-2). A new 16 inch diameter water supply pipeline will connect the proposed plant with the West Kern Water District 1.8 miles to the east. The line will follow an existing right-of-way and will rest on existing pipe supports or on new supports in the existing pipe corridor. Please see the Project Description section for a more detailed description of the project and site.

To determine the potential for soil or groundwater contamination at the site and along the transmission and pipeline routes, MSCC contracted with WZI, Inc. consultants to perform a Phase I Environmental Site Assessment (ESA) (MSCC 1999a, AFC Appendix Q). The ESA was performed in accordance with American Society for Testing and Materials practice E 1527-97, and included:

- A review of current and past uses of the property;
- A site reconnaissance to assess evidence of current and/or past use or storage of toxic or hazardous material; visible soil discoloration; aboveground or underground storage tanks; electrical transformers containing polychlorinated biphenyls; and drums, barrels and other storage containers;
- A visual review of adjacent properties and facilities to assess their potential to adversely impact the site; and
- A review of readily available federal and state agency lists of known or potential hazardous waste sites or landfills, and sites currently under investigation for environmental violations in the site area.

The existing Midway Sunset Cogeneration Plant is adjacent to the proposed site on the east. East of the cogeneration plant lies the Midway Sunset Oil Field. The remainder of the property is used for livestock grazing or is undeveloped. A review of the California Department of Conservation, Division of Oil, Gas and Geothermal Resources data indicated that no producing or abandoned wells are located on the property, although producing oil wells and related facilities are located adjacent to the east of the existing cogeneration plant. The ESA also reports that no underground storage tank sites or other mapped sites were found in the search of available government records either on the subject property or within the search radius around the subject property (MSCC 1999a, AFC p. 15). A site reconnaissance was performed to obtain information indicating the likelihood of recognized environmental conditions in connection with the proposed site and

included inspecting for hazardous substances, solid wastes, stains, and odors. The reconnaissance found no obvious environmental liabilities or threats to the property from adjacent properties or the surrounding area (MSCC 1999a, AFC p. 20).

The ESA concluded that no areas of environmental concern were identified within the proposed site or associated water supply line and transmission line corridors and that no additional investigation is required (MSCC 1999a, AFC p. 21). However, since the Phase I ESA does not categorically eliminate the possibility of encountering contaminated soil, staff does recommend that a certified environmental professional be available to provide guidance in the event that such soil is encountered during project construction (see proposed condition of certification **WASTE-4**).

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION

Construction of the Western MSCC powerplant, transmission line, and water supply line will generate both hazardous and non-hazardous wastes. Non-hazardous wastes include debris requiring removal during site grading and excavation, excess concrete, lumber, scrap metal, insulation, empty chemical containers, and miscellaneous materials such as paper, glass, and plastic from packaging materials. MSCC estimates that up to 500 tons of solid wastes will be generated during construction (MSCC 1999a, AFC p. 5.14-5). AFC Table 5.14-2 summarizes the amounts and types of wastes that will be generated during facility construction and their management methods. Recycling of scrap metal, copper wire, empty containers, and absorbent materials will total about 20 cubic yards every three weeks (MSCC 1999a, AFC p. 5.14-6). Wastes that cannot be recycled will be disposed of at a Class III (non-hazardous) landfill.

Relatively small quantities of hazardous wastes will be generated from construction activities and include waste oil and grease, paint, spent solvent, lube oil, lead acid batteries, and cleanup materials from spills of hazardous substances. These wastes will be temporarily stored onsite in containers prior to transportation via a licensed hauler to a recycling or disposal facility (MSCC 1999a, AFC p. 5.14-6,7). AFC Table 5.14-2 lists construction-related hazardous wastes, their estimated quantities, and management methods.

Additional wastes could be generated if contaminated soils are encountered during site preparation or linear facility construction. As noted above, however, the Phase I ESA did not find any evidence of recognized environmental conditions on the site or linear routes, meaning that there is a low probability that significant contamination would be found.

Staff concludes that there are not likely to be significant impacts due to managing wastes from facility construction because all such wastes will be handled in conformance with applicable LORS and in an environmentally safe manner.

OPERATION

Under normal operating conditions, the Western MSCC project will generate both non-hazardous and hazardous wastes.

Non-hazardous wastes generated during plant operation include trash, office wastes, empty containers, broken or used parts, used packing material, and used filters. On a daily basis, the quantities of such wastes generated from gas-fired facilities such as the proposed project are typically minor, on the order of a few cubic yards or less, with some of the material being recyclable. Non-hazardous waste will be recycled where practical and the remainder disposed to a Class III (non-hazardous) landfill (MSCC 1999a, AFC p. 5.14-6). AFC Table 5.14-3 presents a summary of operating waste streams and management methods.

Hazardous wastes generated during routine project operation include cleaning solutions, spent air pollution control catalyst, used lubricating oil, used solvents, waste paint and thinner, lead-acid batteries, contaminated cleanup materials, and empty chemical containers. AFC Table 5.14-2 describes the types and quantities of hazardous wastes expected to be generated during facility operation.

Certain hazardous wastes can be recycled, such as used oil, catalyst, and batteries. Spent air pollution control catalyst is typically returned to the manufacturer for reclamation or disposal, and used oil is collected by a licensed oil recycler. All hazardous wastes will be collected by licensed haulers to a recycling or Class I treatment, storage, or disposal facility (MSCC 1999a, AFC p. 5.14-13).

Used containers of hazardous substances, such as chemical containers or oil filters may be classified as hazardous wastes. However, if managed according to certain regulatory guidelines, such containers may be managed as non-hazardous (Cal. Code Regs., tit. 22, sec. 66261.7, 66266.130).

Staff concludes that there will be no significant impacts due to managing wastes from facility operation because all such wastes will be handled in conformance with applicable LORS and in an environmentally safe manner.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

Non-hazardous wastes from project construction and operation will be disposed of at the Taft Class III landfill owned and operated by the Kern County Waste Management Department (MSCC 1999a, AFC p. 5.14-6). The Taft landfill currently has a use rate of about 67 tons per day, and a remaining capacity of about 6.7 million cubic yards. Its currently estimated remaining life is thus about 150 years. However, Taft may become a regional landfill with an increased rate of use and a correspondingly shorter life, but will still remain adequate for Western MSCC project wastes. AFC Table 5.14-1 lists four additional county landfills which could receive project wastes. Of these, the Arvin landfill only has a remaining life of about one to

three years, and the Lost Hills landfill has a low use rate of about ten tons per day (Kidwell 2000). The two remaining landfills are Bena and Shafter-Wasco. Bena's currently permitted Phase I is scheduled to close in about 2004. However, additional phases provide about 41 million cubic yards of additional capacity and will be operational until 2033. Shafter-Wasco has a remaining capacity of over eight million cubic yards, with a remaining life of 20 years.

Cumulatively, the landfills have remaining disposal of over 49 million cubic yards and operational lifetimes adequate for the Western MSCC project. Even discounting the effects of recycling on the total amount of non-hazardous wastes destined for land filling, the amount of such wastes generated during project construction and operation are insignificant relative to existing disposal capacity, and would not meaningfully impact landfill operations.

Three Class I landfills in California are permitted to accept hazardous waste: Chemical Waste Management's Kettleman Hills facility and Safety-Kleen Environmental Service's landfills in Buttonwillow in Kern County and Westmoreland in Imperial County. In total, there is in excess of twenty million cubic yards of remaining hazardous waste disposal capacity in California with remaining lifetimes as long as 90 years.

Much of the hazardous waste generated during facility construction and operation will be recycled, such as used oil and spent catalyst. Even without recycling, the generation of hazardous waste from this facility would be minor and would not significantly impact the capacity or remaining life of any of California's Class I landfills.

CUMULATIVE IMPACTS

Cumulative waste management impacts include those associated with construction and operation of similar projects, including La Paloma, Elk Hills, and Sunrise. As with the construction and operation of the proposed Western MSCC project, relatively minor amounts of wastes will be generated during construction and operation of each of these projects. Due to the insignificant impacts on individual disposal facilities combined with the availability of regional landfills as well as the potential for future landfill expansion, cumulative impacts will be insignificant for both hazardous and non-hazardous wastes.

FACILITY CLOSURE

During any type of facility closure (see staff's General Conditions section which discusses planned, unexpected temporary, and unexpected permanent closure), the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. Staff believes that conditions of certification in the General Conditions section will adequately address waste management issues related to closure.

In the case of unexpected temporary closure, waste management practices normally would required that LORS and already in-place (such as limiting hazardous waste accumulation time to 90 days and requiring proper containment) would likely be adequate to avoid significant problems. In addition, staff's General Conditions for Facility Closure require preparation of an on-site contingency plan which shall provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As stated above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

For planned permanent closure, MSCC will submit a decommissioning plan to the CEC twelve months prior to planned closure (MSCC 1999a, AFC p. 3.10-1). All equipment containing hazardous material residue will be decommissioned according to a plan that will protect the environment and human health. All wastes will be removed from the facility and transported to a permitted facility.

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Applicable LORS require the applicant to dispose of hazardous and non-hazardous wastes at facilities approved by the Central Valley Regional Water Quality Control Board or the Cal EPA - Department of Toxic Substances Control. MSCC will manage all project-generated hazardous wastes under the auspices of its existing U.S. EPA identification number as a hazardous waste generator (EPA ID # CAD982525016). State and federal law require MSCC to properly store; package and label waste, use only approved transporters, prepare hazardous waste manifests, and keep detailed records. Pursuant to California Code of Regulations, Title 22, section 67100.1 et seq., a hazardous waste source reduction and management review may be required, depending on the amounts of hazardous waste ultimately generated.

Energy Commission staff concludes that MSCC will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during project construction and operation.

MITIGATION

MSCC intends to implement the following mitigation measures during construction and operation of the proposed project:

- Hazardous and non-hazardous wastes will be recycled where possible (MSCC 1999a, AFC pp. 5.14-5,14).

- A detailed waste management plan will be prepared prior to facility start-up (MSCC 1999a, AFC p. 5.14-12).
- Procedures to minimize hazardous waste generation will be established, including employee training, reuse of hazardous materials where possible, and substituting non-hazardous materials for hazardous ones where possible (MSCC 1999a, AFC p. 5.14-14).

Energy Commission staff has examined the mitigation measures proposed by the applicant and concluded that these measures, together with applicable LORS, will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste.

In the project application phase, certain details concerning plant construction and operation remain to be finalized, including specific methods of waste management. MSCC has proposed general methods of managing project-related wastes, which staff concludes are adequate to prevent significant environmental impacts. However, staff will propose that MSCC prepare a waste management plan which will specify how project wastes will be managed once all details of plant operation are determined (see proposed condition of certification **WASTE-2**).

CONCLUSIONS AND RECOMMENDATIONS

Energy Commission staff concludes that management of the wastes generated during construction and operation of the MSCC project will not result in any significant adverse impacts if MSCC implements the mitigation measures proposed in the Application for Certification (99-AFC-9), the additional measure proposed by staff, and the proposed conditions of certification.

Staff recommends that if potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, MSCC have an environmental professional (as defined by American Society for Testing and Materials practice E 1527-97 Standard Practice for Phase I Environmental Site Assessments) determine the need for sampling to confirm the nature and extent of contamination. If significant remediation is required, MSCC should also contact representatives of the Kern County Environmental Health Services Department and the Sacramento regional office of the Cal EPA Department of Toxic Substances Control for possible oversight.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner, upon becoming aware of any waste management-related enforcement action taken or proposed to be taken against it, or against any waste hauler or disposal facility or treatment operator with which it contracts, shall notify the CPM.

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

WASTE-2 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CPM a waste management plan, including revisions based on the CPM's comments, for all wastes generated during construction and operation of the facility. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 60 days prior to the start of construction, or a lesser time as mutually agreed upon by the project owner and the CPM, the project owner shall submit the construction waste management plan to the CPM for review. The operation waste management plan shall be submitted no less than 60 days prior to the start of project operation, or a lesser time as mutually agreed upon by the project owner and CPM. The project owner shall submit any required revisions within 30 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-3 The project owner shall have an environmental professional available for consultation during soil excavation and grading activities. The environmental professional shall meet the qualifications of such as defined by the American Society for Testing and Materials designation E 1527-97 Standard Practice for Phase I Environmental Site Assessments as evidenced by one of the following or similar credentials: (1) Certified Industrial Hygienist with experience in worker exposure monitoring, (2) Qualified Environmental Professional certification, (3) Registered Environmental Assessor II, or (4) Registered Professional Engineer with experience in remedial investigation and feasibility studies.

Verification: At least 30 days prior to the start of construction, the project owner shall submit the qualifications and experience of the environmental professional to the CPM for approval.

WASTE-4 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, the environmental professional shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action, prior to any further construction activity at that location.

Verification: The project owner shall submit any reports filed by the environmental professional to the CPM within five days of their receipt.
If, in the opinion of the environmental professional, significant re-mediation is required, the project owner shall contact representatives of the Kern County Department of Environmental Health and the Sacramento Regional Office of the California Department of Toxic Substances Control for guidance and possible oversight.

REFERENCES

Kidwell. 2000. Gabrielle Kidwell. Kern County Waste Management Department. Telephone conversation with Mike Ringer, CEC staff. March 7.

MSCC (Midway Sunset Cogeneration Company) 1999a. Application for Certification, Western Midway Sunset Cogeneration Company Project (99-AFC-9). Submitted to the California Energy Commission, December 22, 1999.

LAND USE

Testimony of Amanda Stennick

INTRODUCTION

The land use analysis of the Western Midway Sunset Cogeneration Company Project (Western MSCC) focuses on two main issues: the project's consistency with local land use plans, ordinances and policies; and the project's compatibility with existing and planned land uses. Indirect land use impacts such as noise, traffic, visual resources, air quality, biology, transmission line safety and nuisance, or public health are discussed in those specific areas of this staff assessment.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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 1994). 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 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.
- 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.
- 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.
- 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.

SPECIAL TREATMENT AREAS

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.

The following tables indicate the Kern County General Plan land use designations and existing land uses of the proposed project and transmission line corridors.

GENERAL PLAN LAND USE DESIGNATIONS WITHIN THE STUDY AREA

The existing general plan land use designations for the facility are represented in **LAND USE Table 1**.

LAND USE Table 1

Location or Linear Facility	Land Use Designation
Western MSCC Power Plant site	Mineral and Petroleum
Route 1 (R1)Transmission Line	Mineral and Petroleum/Extensive Agriculture/Intensive Agriculture
Route 2 (R2) Water Supply Pipeline	Mineral and Petroleum

EXISTING LAND USES WITHIN THE STUDY AREA

The existing land uses for the facility are represented in **LAND USE Table 2**.

LAND USE Table 2

Location or Linear Facility	Existing Land Uses
Western MSCC Power Plant site	Undeveloped/Oil Field
Route 1 (R1)Transmission Line	Undeveloped/Oil Field/BLM Lands/CDFG Lands/Calif. Aqueduct/Levee/Flood Canal/Agriculture
Route 2 (R2) Water Supply Pipeline	Undeveloped/Oil Field/BLM Lands

LAND USE PLANS AND POLICIES RELATED TO WESTERN MSCC

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 Preliminary Staff Assessment (PSA) for a discussion of the applicable policies of the Kern County General Plan in these technical areas. Please refer to the **Biological Resources** section of the PSA for a discussion of the applicable policies of the U.S. Fish and Wildlife Service and the California Department of Fish and Game.

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).

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.

The following table indicates the Kern County zoning designations of the proposed project and linear corridors.

LAND USE Table 3

Location or Linear Facility	Zoning Designations
Western MSCC Power Plant Site	Exclusive Agriculture (A)
Route 1 (R1)Transmission Line	Exclusive Agriculture (A)/Limited Agriculture (A-1),
Route 2 (R2) Water Supply Pipeline	Exclusive Agriculture (A),

These chapters of the Kern County Zoning Ordinance also apply to the project: Section 19.80.30 of Chapter 19.80 (Special Development Standards – Commercial and Industrial Districts); Section 19.82.090 of Chapter 19.82 (Offstreet Parking - Design and Development Standards); and Section 19.86.060 of Chapter 19.86 (Landscaping Standards – Industrial Uses).

SETTING

The proposed project is located in western Kern County, about 40 miles west of Bakersfield, California. The proposed site is adjacent to the existing Midway Sunset Cogeneration Company Plant (MSCC), and is about three miles west of State Route 33, six miles northwest of the community of Fellows, and two and one-half miles

southwest of Derby Acres. There are no parks, recreational, educational, religious or health care facilities, agricultural areas, or commercial uses on the site or within a one-mile radius of the site. Please refer to the **Project Description** section for a map showing the regional location of the project. Components of the project and their impacts are discussed below.

IMPACTS

CONSTRUCTION OF POWER PLANT

The project site is designated Mineral and Petroleum in the Kern County General Plan. Based on policies in the Kern County General Plan, the project is compatible with the existing land use designation. 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. In addition, MSCC proposes to create a thirty-acre parcel for development of the project. To satisfy provisions of the Subdivision Map Act, the Kern County Planning Department determined that MSCC file an application for a lot line adjustment. MSCC filed the application in May 2000 and Kern County approved the application in May 2000. MSCC has provided verification that all conditions of approval have been met and Kern County recorded the lot line adjustment on September 28, 2000.

TRANSMISSION LINES

Transmission Line Route 1 passes through land zoned A-1 (Limited Agriculture) and A (Exclusive Agriculture) and will parallel the entire length of the existing Midway Sunset 230 kV line. Under the Kern County Zoning Ordinance, transmission lines are permitted by right in all zones, and require no discretionary permits from the county (Kern County Zoning Ordinance Section 19.08.090). The existing land uses for linear facilities are represented in **Land Use Table 2.** The towns of McKittrick and Buttonwillow are located 0.6-mile west and 0.5 mile north, respectively, of the line at milepost 18.1. Sensitive receptors within one-half mile of the Route 1 corridor include residences, Buttonwillow Park, and row crops; McKittrick School and Buttonwillow Union School are located 0.8 mile west and northwest, respectively of the Route 1 corridor. Please refer to the **Transmission Line Safety and Nuisance** section for a discussion of sensitive receptors near transmission lines.

WATER PIPELINE

Route 2 Water Supply Line passes through land zoned A (Exclusive Agriculture) and will use the same corridor that now exists for MSCC's steam and water lines. Under the Kern County Zoning Ordinance, underground facilities for gas and water lines are permitted by right in all zones, and require no discretionary permits from the county (Kern County Zoning Ordinance Section 19.08.090). The existing land uses for linear facilities are represented in **Land Use Table 2.**

DEPARTMENT OF CONSERVATION'S DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Please refer to the **Transmission Line Safety and Nuisance** and **Water Quality** sections for a discussion of compliance with LORS, impacts and proposed mitigation in this area.

AGRICULTURAL RESOURCES

Information contained in the AFC states that Route 1 Transmission Line will cross irrigated row crops from milepost 14.8 to 19.0. This land is considered Prime agricultural land as defined by the California Department of Conservation (MSCC 1999a). No other agricultural lands affected by construction of the project and its linear components are considered Prime, Unique, or Farmland of Statewide Importance as defined by the California Department of Conservation (MSCC 1999a). As stated above, transmission lines in the A and A-1 districts are permitted by right, and require no discretionary permits from the county. Therefore, because the route will parallel the entire length of the existing Midway Sunset 230 kV line, Energy Commission staff does not consider this an adverse or significant impact to agricultural use.

CUMULATIVE IMPACTS

In general, Energy Commission staff considers conversion of agricultural lands to non-agricultural uses, and changes in land use patterns to be significant cumulative impacts.

Existing land use in western Kern County is characterized by oil fields and natural resource development, with land designated and zoned for agricultural use, grazing, resource extraction, and energy development uses. In addition to the proposed project, other regional projects include La Paloma, Elk Hills, Sunrise, and Pastoria. Because these projects are located within existing oil fields, no conversion of agricultural lands or changes in land use patterns are expected to occur as a result of project construction and operation. For these reasons, Energy Commission staff finds that La Paloma, Elk Hills, Sunrise, Pastoria, and the proposed Western MSCC project will not have a significant adverse cumulative impact on agricultural land use and existing land use patterns in western Kern County.

CONSISTENCY WITH LAND USE PLANS, POLICIES, AND REGULATIONS

The project site is designated Mineral Petroleum in the Kern County General Plan. Based on policies in the Kern County General Plan, the project is compatible with this land use designation. The site is zoned Exclusive Agriculture (A). The proposed transmission line route will traverse lands zoned Exclusive Agriculture and Limited Agriculture. The Kern County Zoning Ordinance states that transmission lines, resource extraction, and energy development uses in these zones are permitted by right, and require no discretionary permits from the county. However, power plants are a conditional use in this zone. Therefore, to satisfy certain provisions of Chapters 19.12, 19.86, and 19.82 of the Kern County Zoning

Ordinance, Energy Commission staff has required MSCC to prepare a site development plan that includes provisions to satisfy the following requirements of the Kern County Zoning Ordinance (please refer to **MITIGATION**, below).

In addition, MSCC proposes to create a thirty-acre parcel for development of the project. To satisfy provisions of the Subdivision Map Act, the Kern County Planning Department determined that MSCC file an application for a lot line adjustment. MSCC filed the application in April 2000 and a certificate of compliance was issued by Kern County on September 28, 2000. Energy Commission staff finds that with the proposed condition of certification **LAND-1**, MSCC will comply with all federal, state, and local applicable laws, ordinances, regulations, standards, plans and policies.

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

MSCC has proposed four mitigation measures that they will implement for the proposed project 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 MSCC's four mitigation measures (listed below) into the proposed conditions of certification as **LAND-1**. These conditions will be part of the site development plan that MSCC submits to the Kern County Planning Department.

- Comply with regulatory agency permits and requirements concerning land use issues.
- Develop small-scale construction scheduling where appropriate to avoid conflicts with agricultural operations during sensitive time periods.
- Where applicable, 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, and 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 MSCC to prepare a development plan that complies with Kern County's zoning conditions of approval (**LAND-1**). Kern County's zoning conditions of approval are stated below. Please refer to **Water and Soils, Worker Safety, Public Health, Air Quality, Visual, and Facility Design** for analysis of Kern County zoning conditions of approval relative to each technical area.

1. The applicant shall comply with applicable requirements of the Subdivision Map Act and Kern County Land Division Ordinance.

2. All vehicle parking and maneuvering areas and access roads shall be surfaced with a minimum of two inches of Asphalt Concrete paving or material of higher quality.

3. 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 five percent of the interior parking area shall be landscaped, with vegetation planted at a ratio of one plant 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.

4. 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.

CONCLUSION AND RECOMMENDATION

Energy Commission staff's 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. If the Commission certifies the proposed project, staff recommends that it adopt the following condition of certification.

PROPOSED CONDITIONS OF CERTIFICATION

LAND USE-1 Prior to the issuance of building or grading permits, the project owner shall submit a site development plan for the project to Kern County for their review and comment, and to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The site development plan shall comply with all applicable provisions of Chapters 19.12, 19.86, and 19.82 of the Kern County Zoning Ordinance. The project owner shall provide a letter of comment from the Kern County Planning Director stating that the project is consistent with the provisions of the Kern County General Plan and Zoning Ordinance.

Protocol: The site development plan shall include a landscaping plan. If the CPM notifies the project owner that revisions of the site development plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan. The landscaping shall not be planted before the plan is approved. The project owner shall notify the CPM when the landscaping has been planted and is ready for inspection.

Verification: At least 60 days prior to the start of any site mobilization the project owner shall submit the proposed site development plan and landscape plan and a copy of the letter of comment from the Kern County Planning Director to the CPM for review and approval. The project owner shall submit any required revisions within 30 days of notification by the CPM. The project owner shall complete installation of the landscaping by the end of the first planting season following first electricity generation. The project owner shall notify the CPM within seven days after the landscaping is planted that the landscaping is ready for inspection.

REFERENCES

Kern County General Plan, adopted March 1982. Revised March 1994.

Kern County Zoning Ordinance, July 1997.

Midway (Western Midway Sunset Co) 1999a. Application for Certification. Submitted to the California Energy Commission/Smith on December 22, 1999.

Midway (Western Midway Sunset Co) 2000d. Supplementary AFC Material in Response to Data Adequacy Worksheets. Submitted to the California Energy Commission on February 9, 2000.

Planning (County of Kern/Planning Dept./James) 2000c. Suggested Condition Headings for Midway Sunset (Attached: Cover Letter). Submitted to California Energy Commission on February 16, 2000.

Rickels, David. Senior Planner, Kern County Planning Department. March 18, 1999 FAX to Amanda Stennick regarding La Paloma facility closure plans.

Rickels, David. Senior Planner, Kern County Planning Department. February 16, 2000 FAX to Amanda Stennick regarding conditions of approval for Midway Sunset project.

TRAFFIC AND TRANSPORTATION

Testimony of Steven J. Brown, P.E.

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 analyzes the potential traffic and transportation impacts associated with construction and operation of the Western Midway Sunset Cogeneration Company Project (Western MSCC).

This analysis includes an evaluation of the influx of large numbers of construction workers, and how, over the course of the construction phase, they can increase roadway congestion and also affect traffic flow. The transmission lines and underground water supply pipelines are proposed to cross or be located along a public right-of-way, requiring trenching or other activities disruptive to traffic flows. The review also considered the transportation of large pieces of equipment and how this transport can increase roadway congestion and traffic hazards. There are no permanent changes proposed by the applicant to the existing transportation network or its use after completion of construction. On-going (post construction) operations and maintenance traffic will represent a negligible increase over current conditions; however, it will include a slight increase in the transportation of hazardous materials to the project site. In all cases, the transportation of hazardous materials will need to comply with federal and state laws.

Staff has analyzed the information provided in the AFC and from other sources to determine the potential for the Western MSCC project to have significant traffic and transportation impacts, and has assessed the availability of mitigation measures that could reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable Laws, Ordinances, Regulations, and Standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

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

Title 49, Code of Federal Regulations, Sections 350-399, and Appendices A-G, Federal Motor Carrier Safety 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 rights-of-way. In addition, the California Health and Safety Code addresses the transportation of hazardous materials.

Provisions within the California Vehicle Code are:

- Section 353 defines hazardous materials. California Vehicle Code, Sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- Sections 31600-31620 regulate the transportation of explosive materials.
- Sections 32000-32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.
- Sections 32100-32109 establish special requirements for the transportation of inhalation hazards and poisonous gases.
- Sections 34000-34121 establish special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11 regulate the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- Sections 25160 et seq. address the safe transport of hazardous materials.
- Sections 2500-2505 authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- 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, the possession of certificates permitting the operation of vehicles transporting hazardous materials are required.
- California Streets and Highways Code, Sections 117 and 660-72, and California Vehicle Code, Sections 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Street and Highways Code, Sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.

All construction within the public right-of-way will need to comply with the “Manual of Traffic Controls for Construction and Maintenance of Work Zones” (Caltrans, 1996).

LOCAL

The 1992 Kern County General Plan Circulation Element includes local goals and guidance policies about building and transportation improvements that are pertinent to the Western MSCC project. The General Plan introduces planning tools

essential for achieving the local transportation goals and policies and includes circulation policies and implementation measures for state highways and local rural community streets within the Buttonwillow Community Development Plan and the Derby Acres Rural Community Plan.
Relevant goals and policies of the Kern County General Plan include:

- As a condition of private development approval, developers shall build roads needed to access the existing road network (Private Development Access to Existing Roadway Network - Policy 1).

The Kern Council of Governments has prepared a Congestion Management Plan (CMP) to ensure that a balanced transportation system is developed relative to population and traffic growth, land use decisions, level of service (LOS) performance standards, and air quality improvement. The current CMP (adopted in 1998) is intended to be an integral and complementary part of Kern County's plans and programs.

The Kern County Regional Transportation Plan (RTP) has established regional transportation goals, policies, objectives, and actions for various modes of transportation that guide transportation policy in the region. The Kern County RTP (adopted in 1998), states that the standard for the roadways and intersections is LOS D.

SETTING

REGIONAL DESCRIPTION

The proposed Western MSCC project is bordered on the west and south by the Temblor range, on the east by Midway Sunset Oil Field, and on the north by the Telephone Hills in Kern County, California. The project site is located on West Crocker Springs Road adjacent to the existing MSCC plant. Descriptions of some of the critical roads and highways in the study area are provided below. Figure 1 illustrates the major roads, potential access roads, and highways in the project area.

STATE HIGHWAYS AND LOCAL ROADWAYS

The major highways in the area of the project site are State Route (SR) 43, SR 119, SR 166, SR 33 (Westside Highway), SR 58, and Interstate 5. There are five county-maintained roadways affected by the proposed project: Midway Road, Midoil Road, Mocal Road, Shale Road, and West Crocker Springs Road. These local roads primarily serve traffic related to the oil field activities in the area and would provide connections to the project site from State Route 33.

West Crocker Springs Road extends from the western Kern County limits to its terminus at Mocal Road. Near the site, West Crocker Springs Road is approximately 17 feet wide (edge of pavement to edge of pavement) with no existing paved shoulders. This facility is classified as a two-lane local roadway and carries approximately 800 vehicles per day. The Western MSCC project site is served primarily from access points along West Crocker Springs Road.

SR 33 provides access to the site via Mocal Road, Midoil Road, Shale Road, and West Crocker Springs Road. SR 33 traverses most of the State of California along the coast and is under the jurisdiction of the California Department of Transportation (Caltrans). In the vicinity of the Western MSCC project site, SR 33 is a two-lane highway with a 60-MPH design speed and carries approximately 10,600 vehicles per day.

TRAFFIC AND TRANSPORTATION Figure 1
Regional Transportation Setting

SR 58 is a two-lane east–west highway that connects to SR 33, SR 43, Interstate 5, and SR 99. SR 58 would primarily serve project traffic traveling from Bakersfield to connect to SR 33 and access the project site. Daily traffic on SR 58 is 6,400 vehicles per day near Interstate 5; 4,800 vehicles per day near the community of Buttonwillow; and 2,750 vehicles per day farther west near Lokern Road.

SR 43 is a two-lane north-south highway that extends from its terminus at SR 119 to Santa Fe Way (Central Valley Highway) near the community of Shafter. SR 43 carries approximately 3,550 vehicles per day near its junction with SR 119.

SR 119 is a two-lane east-west highway extending from SR 33 to SR 99. SR 119 serves traffic traveling to/from the City of Taft and would primarily serve project traffic traveling to and from Midway Road to access the project site. SR 119 carries approximately 8,400 vehicles per day near its junction with SR 43, and 4,250 vehicles per day near its junction with SR 33.

Interstate 5 serves regional and countywide travel as the major through route for the region. Through Kern County, it is a four-lane highway with interchanges at SR 58, SR 43, SR 119, at-grade intersections with county roads, and carries approximately 23,500 vehicles per day at these interchanges.

ACCIDENT HISTORY

For roadway segments, accident rates are computed as the number of accidents per million vehicle-miles of travel (MVM). Information in the AFC indicates that accident rates for roadways in the vicinity of the project site ranged from 0.25 to 5.03 accidents per million vehicle-miles traveled, based on a route segment report prepared by Caltrans in 1998. Statewide average accident rates for similar facilities range from 0.71 for freeways and 2.27 for conventional multilane facilities (Western MSCC AFC, 1999).

Several state highways have accident rates higher than the statewide averages in the project area. SR 119 at its junction with SR 33 has an accident rate of 5.03 accidents per MVM, and 4.11 accidents per MVM at its junction with SR 99. SR 43 has an accident rate of 2.90 at its junction with SR 58.

In addition, the AFC also indicates that a significant number of accidents have occurred on county roads affected by the Western MSCC project. Over a three-year period from January 1995 to December 1998, 11 accidents have occurred on Mocal Road, 9 accidents on Midoil Road and 3 on West Crocker Springs Road. This translates into an accident rate of approximately 3.0 accidents per MVM for Mocal Road and Midoil Road, and a rate of approximately 2.3 accidents per MVM on West Crocker Springs Road (based on the number of accidents and the Average Annual Daily Traffic reported for these roadways in the AFC).

RAILWAYS

Rail service in the project area is provided along three rail line corridors. The Burlington-Northern & Santa Fe (BN&SF) line is located northeast of the project area running parallel to State Route 43 through the Central Valley. The Union

Pacific Buttonwillow Branch runs through Bakersfield and continues west to the town of Buttonwillow where it terminates (12 miles northeast of McKittrick). The BN&SF Sunset Branch line runs southwesterly from Bakersfield toward the Buena Vista Lake Bed. However, according to the AFC, this line is in very poor condition and is unsuitable for use.

TRUCK TRAFFIC

Truck traffic on the highways serving the project area is heavy due to local agricultural and oil-related industries. Kern County has not adopted local weight or load limitations. Therefore, the California Vehicle Code limits apply to all study roadways (including state routes). These limits are 20,000 pounds per axle and 10,500 per wheel or wheels on one end of the axle.

CURRENT ROADWAY AND INTERSECTION OPERATING CONDITION

The operating conditions of a roadway system are described using the term “level of service”. Level of service (LOS) is a description of a driver’s experience at an intersection or roadway based on the level of congestion (delay). However, it is not a measure of safety or accident potential. Intersection and roadway LOS can range from “A”, representing free-flow conditions with little or no delay, to “F”, representing saturated conditions with substantial delay. An LOS D threshold, as noted earlier, is the minimum standard accepted by Kern County.

Table DR –5.11-4 of data request responses 35 for the Western MSCC Project summarizes the current performance levels of the principal roadways in the project area. The following roadway segments are operating at a level worse than the LOS D standard:

- State Route 33 (State Route 119 to Midway Road);
- State Route 43 (Junction State Route 58 East to Junction State Route 58 West);
- State Route 58 (Lokern Road to State Route 43);
- State Route 99 (State Route 119 to State Route 58 East); and
- State Route 119 (Harrison Street to State Route 43);

According to Table 5.11-3 of the AFC, the five county-maintained roads affected by project traffic operate at acceptable levels under existing conditions.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION PHASE

Based on the data request responses provided by the applicant (Midway 2000s), project impacts were evaluated under the construction phase during the peak hour

of an average construction period, and the peak hour of the peak construction period.

COMMUTE TRAFFIC

Construction is expected to last a total of 20 months. Table DR-5.11-1 of data request response 24 indicates that the estimated construction workforce traveling to/from the site on a typical day is 188, assuming a single shift and a 40-hour work week. This number includes any contractor staff and/or construction related visitors (WZI 2000b). During the peak construction period, approximately 400 construction workers/visitors/staff are expected on a typical weekday.

An estimate of the number of trips by construction workers is based upon a conservative assumption that 100 percent of the workers are driving alone (i.e., no carpooling assumed) to/from the site during the peak hour.

The AFC indicates that parking for the construction workforce will be provided in an area on or adjacent to the project site. Any ride-sharing vehicles will remain on site during work hours.

Data request response 27 indicates that 68 percent of the construction workforce will originate from Bakersfield (east of the project site), 4 percent from Taft (southeast of the project site), 4 percent from Shafter (north of the project site), and 24 percent from parts of southern California (e.g., Los Angeles area) during both the average and peak construction periods (Midway 2000s).

TRUCK TRAFFIC

The increases in construction traffic will consist mainly of deliveries of plant equipment and construction materials to the site. In total, approximately 4,100 deliveries are expected over the 20-month construction phase. This would entail 2,600 light truck deliveries and 1,500 heavy truck deliveries (the AFC specifies a light truck as having 2 axles and a heavy truck as having 3 or more axles). This averages approximately 190 deliveries per month and approximately 10 deliveries per weekday. Truck trips are estimated to be 21 per weekday during the peak construction month. The AFC assumes that the majority of the deliveries will be made from Bakersfield (east of the project site) or Los Angeles (south of the project site).

The AFC also assumes that deliveries to the project site will occur between 7:00 a.m. and 5:00 p.m. on weekdays. However, data request response 29 specifies that all deliveries, in addition to the commute and visitor traffic, are assumed to occur during the peak traffic hour to provide a conservative analysis (Midway 2000s).

The transportation and handling of hazardous substances associated with the Western MSCC Project can increase roadway hazard potential. The handling and disposal of hazardous substances are addressed in the **WASTE MANAGEMENT** and the **HAZARDOUS MATERIALS HANDLING** sections of the Preliminary Staff Assessment. Potential impacts of the transportation of hazardous substances can

be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances. Conditions of certification that ensure this compliance are discussed later in this analysis.

The State Department of Motor Vehicles specifically licenses all drivers who carry hazardous materials. Drivers are required to carry a manifest available for inspection by the California Highway Patrol at inspection stations along major highways and interstates, and to check for weight limits and conduct periodic brake inspections. Commercial truck operators handling hazardous materials are also required to take instruction in first aid and procedures on handling hazardous waste spills.

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) are equally important to ensure that the transportation and handling of hazardous materials are done in a manner that protects public safety. Enforcement of these statutes is under the jurisdiction of the California Highway Patrol. For an in-depth description of the amount and type of hazardous materials that will be used during the construction of the facility, see the **WASTE MANAGEMENT** and **HAZARDOUS MATERIALS HANDLING** sections of the Preliminary Staff Assessment.

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

The AFC predicts that the spatial pattern of truck trips will be as follows: 70 percent of truck deliveries would originate in Bakersfield, 20 percent will originate in the Los Angeles area (south of the project site), and approximately 10 percent will originate in the areas north of Bakersfield.

TOTAL PROJECT CONSTRUCTION TRAFFIC

Product deliveries via truck traffic will contribute, along with other Western MSCC - generated traffic, to create localized impacts to roadway performance. During an average construction period, the Western MSCC project would generate 188 commute trips and approximately 10 truck deliveries for a total of 198 trips per day. Based on information provided by the applicant, truck deliveries are assumed to consist of 1 trip per delivery during the peak hour (i.e., round trips that include both arrival and departure trips for deliveries are not expected to occur during the same peak hour due to time considerations given for unloading and other incidentals) (WZI 2000b).

During the peak construction period, the Western MSCC project would generate 400 commute trips and approximately 21 truck deliveries for a total of 421 trips per day. As noted earlier, all trips were assumed to occur during the peak hour for both average and peak construction periods to provide a conservative analysis. However, the total project construction traffic condition does not include linear facility construction traffic trips.

ROADWAY AND INTERSECTION OPERATING CONDITIONS

The combination of commute, truck, and visitor traffic will degrade roadway operations in the local area. The addition of project construction traffic will degrade the level of service on the following road segments from LOS D to LOS E during both the peak hour of an average construction workday and the peak hour of a peak construction workday:

SR 33 (SR 166 to SR 119 east); and

SR 119 (Interstate 5 to SR 99).

In addition, the project will result in increases in traffic on roadways already operating worse than the LOS D threshold. The following road segments will continue to operate below the LOS D threshold, the minimum standard accepted by Kern County during both the peak hour of an average construction workday and the peak hour of a peak construction workday:

- SR 33 (SR 119 to Midway Road) – LOS E;
- SR 43 (Junction SR 58 East to Junction SR 58 West) – LOS E;
- SR 58 (Lokern Road to SR 43) – LOS E;
- SR 99 (SR 119 to SR 58 East) – LOS E;
- SR 99 (SR 58 East to SR 58 West) – LOS F; and
- SR 119 (Harrison Street to Golf Course Road) – LOS E;

Mitigation measures to minimize project traffic impacts on the affected state highways are being proposed as part of a construction traffic control and implementation plan (to be coordinated with Kern County). The specific mitigation measures and conditions of certification that ensure this compliance including transportation demand strategies that limit truck and commute traffic to off-peak periods are discussed later in this section. Traffic count data from Caltrans indicates that traffic volumes on affected state highways during off-peak hours are relatively low, and therefore limiting truck and commute traffic associated with the construction of the Western MSCC Project to off-peak travel periods is not expected to cause significant, adverse impacts to the level of service of these highways.

Compliance with the provisions of the transportation permits required from Caltrans would be necessary to ensure that any potential safety impacts on roadways with significantly high accident rates are also minimized. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this section.

A potential safety problem may result with the truck transport of heavy construction equipment and machinery along State Route 58 along a section of this highway north of McKittrick (approximately 1.6 miles in length beginning at milepost 15.42) that has substantial horizontal curvature. Trucks with 3 or more axles carrying heavy construction equipment may have difficulty maneuvering through this highway section and will likely need to make wide turns (into the opposing traffic

lane) around the curves in the roadway. This may cause a safety problem for other vehicles traveling on this portion of the highway due to the limited sight distance, tight turning radii, and lack of any shoulder due to the embankments that enclose the travel way. Mitigation to reduce this impact to less than significant would require flagmen at each end of this 1.6-mile section of SR 58 to stop traffic while any delivery truck passes through. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this section.

According to AFC Tables S2-5.11-11 and S2-5.11-12, the five county-maintained roads affected by project traffic will continue to operate at acceptable levels during both an average construction period and the peak construction period.

Although the AFC addresses project impacts on roadway segments only, a potential traffic impact and safety problem was evaluated for the unsignalized intersection of Midway Road/State Route 119. This 3-way intersection currently provides stop-control on the eastbound (Midway Road) approach and would serve about 135 project trips (129 commute trips and 6 truck delivery trips) during an average construction period and 290 project trips (274 commute trips and 16 truck delivery trips) during a peak construction period for the Western MSCC Project. However, according to Caltrans, this intersection currently warrants a traffic signal and mitigation of any impacts at this intersection related to the Western MSCC project (and other projects) could be accomplished through traffic control via the use of police or flagmen (CAL-TRANS 2000a). Mitigation measures and conditions of certification that ensure this compliance are discussed later in this section.

In addition, field observations indicate that the pavement section of West Crocker Springs Road is only 17 feet wide (edge of pavement to edge of pavement) with no paved shoulder. This would indicate inadequate street width for two-way truck traffic traveling to/from the Western MSCC project site. However, since adequate sight distance is available, trucks would be able to travel on the unpaved shoulder of the roadway for short distances or pull over to allow two-way traffic. The existing average daily traffic on this county road is relatively low and therefore, no significant traffic impacts (i.e., congestion and/or delay) are expected on West Crocker Spring Road. However, the intersection of Mocal Road/West Crocker Springs Road should be widened to provide additional pavement for adequate truck turning radii in order to help facilitate truck turning movements.

RAILWAYS

The AFC indicates that rail lines to transport heavy equipment and machinery will be used whenever possible and cost effective in order to minimize truck transport. Railroad tracks with public access exist off the Union Pacific Buttonwillow Branch line near the end of the railroad line in Buttonwillow. According to the AFC, these tracks provide adequate access conditions to and from the line for cargo to be transferred from railcars to trucks. This line typically employs one train per weekday, transporting various products including construction material and equipment. Consequently, deliveries via rail should not disrupt any existing Union Pacific operations nor would the use of the public access tracks for deliveries to the site have any potential to increase conflicts between trains and automobiles at at-grade

crossings since all relevant public at-grade crossings are equipped with railroad grade crossing warning equipment.

Trucks would proceed south on State Route 58 from the rail transfer to access the Western MSCC project site. This route would employ the section of State Route 58 north of McKittrick (approximately 1.6 miles in length beginning at milepost 15.42) that carries potential safety impacts as described earlier. Mitigation to reduce this impact to less than significant would require flagmen at each end of this 1.6-mile section of SR 58 to stop traffic while any delivery truck passes through as described earlier. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this section.

LINEAR FACILITIES

Construction of the transmission line associated with the Western MSCC project is expected to last 6 months and will require 10 to 25 construction workers per month. The workforce will peak at 25 during construction and conductor installation. According to the AFC, access to the tower structures for the transmission line will be over the existing MSCC and PG&E Diablo transmission line access roads with short access paths to tower sites, or by existing roads, farm roads, and short spur roads as necessary. The transmission line route will cross State Route 33 and Skyline Road. An estimated total of 97 truck deliveries will be made during construction of the transmission line with a peak delivery of 67 vehicles during the 8th month after the start of construction.

Construction of the water supply line is expected to last one month. The peak workforce will be approximately 22 employees during the 14th month following the start of construction. An estimated total of 125 truck deliveries will be made to the water supply line/pump station staging sites during construction of the water supply line. The water supply pipeline crosses West Crocker Springs Road at two locations. Trenching is required within the established right-of-way. At the eastern location, the pipeline will be trenched under the road. However, access for through traffic will be provided at all times. Traffic will be either directed along one-half of the roadway or routed across temporary trench bridging. The construction traffic control plan should include provisions such that at least one lane of traffic flow is maintained in each direction or traffic flow is alternated by direction using flagmen for water facilities being constructed within or adjacent to a public roadway. In addition, all pipeline construction shall take place outside the peak traffic periods to avoid traffic flow disruptions. Access for emergency vehicles will be maintained during construction. Typical plating of roadways will be used to ensure emergency vehicle access and maintain reasonable levels of traffic flow. Use of typical signals, signs, or warnings will notify motorists of construction activity (WZI 2000b). The western crossing of the water supply line will utilize an existing concrete culvert, thereby eliminating any disruption of traffic.

Given the relatively small construction workforce, their distribution at several sites along both the transmission line and water supply pipeline, and the relatively short duration of construction, no significant traffic impacts related to the construction traffic of these facilities are expected on the local roadways and state highways.

Any exceptional needs for traffic control and signing for the affected areas will be addressed in the construction traffic control plan as specified in the proposed conditions of certification. In all cases, construction within the public right-of-way will need to comply with Caltrans' "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans 1996).

All road crossing construction activities will be in accordance with local, state, and federal regulatory requirements and specification. Adequate barricades and lights will be provided around excavations at crossings in accordance with Caltrans' "Manual of Traffic Controls for Construction and Maintenance of Work Zones" and California Vehicle Code Section 21400.

OPERATIONAL PHASE

COMMUTE AND VISITOR TRAFFIC

The operational phase of the new Western MSCC generating plant will require the addition of 5 full-time employees. The existing MSCC site operates a vanpool from Bakersfield that has excess capacity. The employees associated with the Western MSCC project will not require the addition of any vehicles to the pool (Midway 1999a). According to the AFC, adequate parking will be available for employees not utilizing the vanpool. The existing state highway and county roadway system will not be impacted by any increase in commute traffic associated with the operation of the Western MSCC plant; therefore, the commuter and visitor traffic associated with the operational phase of the project is not expected to cause any significant traffic impacts.

TRUCK TRAFFIC

The transportation and handling of hazardous substances associated with the Western MSCC project can increase roadway hazard potential. According to the AFC, the project will add one delivery every other day (approximately 3 deliveries per week) of aqueous ammonia solution. Other hazardous and non-hazardous materials associated with operation of the plant will occur much less frequently (on a per month and per year basis) (Midway 2000o).

Hazardous materials will be transported to the site utilizing state highways as much as possible. According to the AFC, truck routes for the transport of hazardous materials originating in Bakersfield will use SR 58, SR 43, SR 119, and SR 99. These routes would not employ the section of SR 58 north of McKittrick (approximately 1.6 miles in length beginning at milepost 15.42) that carries potential safety impacts as described earlier. However, it should be emphasized that all transport of hazardous materials to to/from the project site should avoid this section of SR 58 for safety reasons described earlier. Hazardous material transport originating in the Los Angeles area (south of the project site) will use Interstate 5, SR 119, SR 166, and SR 33.

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) are equally important to ensure that the transportation and handling of hazardous materials are done in a manner that protects public safety.

Enforcement of these statutes is under the jurisdiction of the California Highway Patrol. For an in-depth description of the amount and type of hazardous materials that will be used during the operation of the facility, see the **WASTE MANAGEMENT** and **HAZARDOUS MATERIALS HANDLING** sections of the Preliminary Staff Assessment.

The existing state highway and county roadway system will not be significantly impacted by any increase in truck traffic associated with the operation of the Western MSCC plant.
Potential impacts of the transportation of hazardous substances can be mitigated to 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 analysis.

LINEAR FACILITIES

The operation of both the transmission and water supply lines will not have an impact on area roadways except for short-term maintenance or unplanned difficulties. In either case, the impacts create traffic flow difficulties that are typically limited in duration and are not expected to cause any significant traffic impacts.

CUMULATIVE IMPACTS

In addition to the traffic generated by Western MSCC project construction activities, the applicant has identified three other Kern County power plant projects (Elk Hills, Sunrise and La Paloma) in its cumulative analysis. According to the AFC, La Paloma is the only project to have been approved and begun construction. The applicant identified four scenarios for cumulative impacts on traffic related to construction of the Western MSCC project and the other proposed Kern County power plant projects (Midway 2000s).

- Scenario 1 - construction of the Sunrise Project would begin September 2000, and construction of the Elk Hills Project would begin December 2000;
- Scenario 2 - construction of the Sunrise Project would begin September 2000, construction of the Elk Hills Project would begin December 2000, and construction of the Western MSCC Project would begin March 2001;
- Scenario 3 – construction of the Sunrise and Elk Hills power plant projects would take place such that the peak traffic months for both projects coincide; and
- Scenario 4 - construction of the Sunrise, Elk Hills, and Western MSCC power plant projects would take place such that the peak traffic months for all three projects coincide.

These scenarios were developed consistent with information contained in the Applications for Certification for the Elk Hills and Sunrise Cogeneration projects (Register 2000).

Tables DR-5.11-7, DR-5.11-8, DR-5.11-9, and DR 5.11-10 of data request response 43 indicates that the addition of the Western MSCC Project to the Sunrise and Elk Hills projects under cumulative conditions (Scenarios 2 and 4) degrades the level of service to unacceptable levels (from LOS D to LOS E) on the following segments of the affected state highways:

- State Route 33 (State Route 166 to State Route 119 east); and
- State Route 119 (Golf Course Road to State Route 43);

Mitigation to minimize the traffic impacts under cumulative conditions on the affected state highways can be accomplished through the implementation of transportation demand strategies that limit all commute and truck traffic related to the construction of the Western MSCC Project to off-peak hours as part of a construction traffic control and implementation plan (to be coordinated with Kern County). Mitigation measures and conditions of certification that ensure this compliance are discussed later in this section.

The AFC does not identify any expected amount of population growth in the region including the Cities of Bakersfield, Taft, Shater, Buttonwillow and McKittrick. Therefore, no assumptions of an increase in traffic volumes were made (other than for the three other Kern County power plant projects identified above) for the state highway or county road system in the affected areas. However, the regional area will likely continue to experience development and traffic volume growth. Consequently, traffic volumes on the regional roadway system will likely increase. The project's level of traffic generation will diminish between the construction and operational phases such that an increase in background traffic should not be problematic.

FACILITY CLOSURE

The anticipated lifetime of the power plant is expected to be in excess of thirty years. At least twelve months prior to the proposed decommissioning, the applicant shall prepare a Decommissioning Plan for submission to the Energy Commission for review and action. 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. The effects of Western MSCC project closure on traffic and transportation will be similar to those discussed for the project itself. Closure will create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials will produce impacts from truck traffic. At this time, no specific conclusions can be drawn on the effects of project closure on traffic and transportation.

MITIGATION

MSCC has indicated their intention to comply with all LORS relating to the transport of oversize loads and the transport of hazardous materials. The applicant should also implement the following traffic and transportation mitigation measures:

- The applicant should enforce a policy that all project-related parking occurs in designated parking areas;
- The applicant should obtain and comply with all necessary encroachment and transportation permits from Caltrans and all other jurisdictions regarding the transportation of heavy equipment and hazardous materials and any construction activity within the public right-of-way;
- Repair any damages to West Crocker Springs Road and Shale Road incurred during Western MSCC project construction to their pre-project construction condition;
- Provide traffic control via a policeman/flagman at the intersection of SR 119/Midway Road during construction, if a traffic signal is not in place at this location prior to the start of construction. Caltrans has confirmed that this intersection has potential safety concerns associated with the eastbound left-turn movement onto SR 119 from Midway Road and currently warrants a traffic signal, thereby validating the use of policeman/flagman throughout the construction phase (CAL-TRANS 2000a).
- Prepare a construction traffic control plan and transportation demand implementation program that limits construction-period truck and commute traffic to off-peak periods, to the satisfaction of Kern County and Caltrans. These plans and programs should establish schedules for major shifts outside of the ambient street traffic peak periods and timing of heavy vehicle equipment and building materials deliveries. This traffic control plan should also include:
- Prohibiting the transport of hazardous material on the section of State Route 58 just north of McKittrick approximately 1.6 miles long beginning at milepost 15.42;
- Use of the Union Pacific Buttonwillow Branch rail line will be used whenever possible and cost effective to transport heavy equipment and machinery in order to minimize truck transport. The applicant should ensure that, if rail lines are utilized, that all at-grade crossings are equipped with railroad grade crossing warning equipment.
- Widening of the Mocal Road/West Crocker Springs Road intersection to provide additional pavement for adequate truck turning radii in order to help facilitate truck turning movements; and
- A construction traffic control plan and implementation program addressing exceptional needs for traffic control and signing for the affected areas related to the construction of linear facilities within the public right-of-way, such as, maintaining access to adjacent residential and commercial properties.

COMPLIANCE WITH LORS

MSCC has stated their intention to comply with all federal, state, and local LORS. A condition to ensure compliance is proposed below. Therefore, the project is considered consistent with identified federal and state LORS.

The project is consistent with Private Development Access to Existing Roadway Network Policy 1 of the Kern County General Plan Circulation Element, as it would provide a project access road to connect to the existing road network.

For operational employees, trip reduction measures could be employed. But, since the maximum number of full-time employees assigned to any one shift is low, trip reduction measures for this project will have an insignificant benefit.

CONCLUSIONS AND RECOMMENDATIONS

POWER PLANT

1. During the construction phase, increased roadway demand resulting from the daily movement of workers and materials will increase congestion and degrade the level of service on some state highways. Mitigation measures should be implemented to minimize these impacts.
2. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal.
3. All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal, state, and local standards and permits established to regulate the transportation of hazardous substances and by avoiding the section of SR 58 just north of McKittrick approximately 1.6 miles long beginning at milepost 15.42.
4. Any impacts related to the construction of linear facilities within the public right-of-way can be mitigated by implementing a construction traffic control plan that includes provisions such that at least one lane of traffic flow is maintained in each direction or traffic flow is alternated by direction using flagmen. In addition, all pipeline construction should take place outside the peak traffic periods to avoid traffic flow disruptions. The owner should also obtain and comply with all necessary encroachment permits from Caltrans and all other jurisdictions.
5. Construction activities have the potential to damage local roadways. The applicant should be required to repair damaged roadways to their original condition.
6. The AFC indicates that parking for the construction workforce will be provided in an area on or adjacent to the project site. No information is provided regarding exactly where the workers would park. The applicant should enforce a policy that all project-related parking occurs in designated parking areas; therefore, construction-period parking is not considered a significant project impact.
7. The addition of Western MSCC project construction traffic to the local roadways and state highways under cumulative conditions will result in increased congestion and degrade the level of service on some state highways. The project's level of traffic generation will diminish between the construction and

operational phases such that an increase in background traffic should not be problematic.

As stated previously, no impacts are expected to occur by shifting truck and commute traffic to off-peak travel periods during construction of the Western MSCC. Traffic count data from Caltrans indicates that traffic volumes during off-peak hours on state highways affected by the Western MSCC project are relatively low.

The conditions of certification proposed below are those that staff has identified as necessary to mitigate project impacts based on the information available.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with California Department of Transportation (Caltrans) and Kern County limitations on vehicle sizes and weights. In addition, the project owner or their contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for both rail and roadway use.

Verification: In Monthly Compliance Reports, the project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months from the date of issuance.

TRANS-2 The project owner or their contractor shall comply with California Department of Transportation (Caltrans) and Kern County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In Monthly Compliance Reports, the project owner shall submit copies of any encroachment 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 from the date of issuance.

TRANS-3 The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed.

Verification: The project owner shall include in its Monthly Compliance Reports copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

TRANS-4 Following completion of project construction of the power plant and all related facilities, the project owner shall repair West Crocker Springs Road and Shale Road to its pre-construction condition.

Protocol: Prior to start of site mobilization, the project owner shall photograph West Crocker Springs Road from Mocal Road to the project site

and Shale Road from SR 33 to Mocal Road. The project owner shall provide the CEC Compliance Project Manager (CPM), Kern County and Caltrans (as appropriate) with a copy of these photographs. Prior to start of site mobilization, the project owner shall also notify Caltrans about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place and to coordinate construction related activities associated with other projects.

Verification: Within 30 days after completion of project construction, the project owner shall meet with the CPM, Kern County and Caltrans to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near original condition as possible. The project owner shall provide to the CPM a letter from Kern County stating their satisfaction with the road improvements.

TRANS-5 During construction of the power plant and all related facilities, the project owner shall enforce a policy that all project-related parking occurs in designated parking areas.

Verification: At least 60 days prior to start of site mobilization, the project owner shall submit a parking and staging plan for all phases of project construction to Kern County for review and comment, and to the CPM for review and approval.

TRANS-6 The project owner shall develop a construction traffic control and transportation demand implementation program to limit construction-period truck and commute traffic to off-peak periods in coordination with Kern County and Caltrans. Specifically, this plan shall include the following restrictions on construction traffic addressing the following issues for power plant construction:

- prohibiting the transport of hazardous material on the section of State Route 58 just north of McKittrick approximately 1.6 miles long beginning at milepost 15.42;
- widening of the Mocal Road/West Crocker Springs Road intersection to provide additional pavement for adequate truck turning radii in order to help facilitate truck turning movements;
- addressing exceptional needs for traffic control and signing for the affected areas related to the construction of linear facilities within the public right-of-way;
- establishing construction work hours outside of the peak traffic periods to ensure that construction workforce traffic occurs during off-peak hours;
- scheduling of heavy vehicle equipment and building materials deliveries to occur during off-peak hours; and
- maintaining access to adjacent residential and commercial properties;

The construction traffic control and transportation demand implementation program shall also include the following restrictions on construction traffic addressing the following issues for linear facilities:

- timing of pipeline construction (all pipeline construction affecting county roads shall take place outside the peak traffic periods to avoid traffic flow disruptions);
- signing, lighting, and traffic control device placement;
- temporary travel lane closures;
- maintaining access to adjacent residential and commercial properties; and
- emergency access;

Verification: At least 30 days prior to start of site mobilization, the project owner shall provide to Kern County and Caltrans for review and comment, and to the CPM for review and approval, a copy of their construction traffic control plan and transportation demand implementation program.

TRANS-7 The project owner shall provide traffic control at the 1.6-mile section of SR 58 beginning at milepost 15.42 just north of McKittrick to allow delivery trucks carrying construction equipment and materials (not hazardous materials) related to the construction of the Western Midway Sunset project to safely pass through this portion of the highway. A flagman at each end of the 1.6-mile highway section will be required to stop all traffic traveling towards the highway section in concern while any delivery truck passes through. The project owner shall provide traffic control during the construction phase of the Western MSCC project.

Protocol: The use of a flagman requires that a Traffic Control Plan be submitted to Caltrans.

Verification: At least 30 days prior to site mobilization, the project owner shall submit a Traffic Control Plan to Caltrans for approval. The project owner shall provide the CPM a copy of a letter from Caltrans acknowledging approval of the Traffic Control Plan at least 15 days prior to site preparation and earth-moving activities.

TRANS-8 If the traffic signal planned for the State Route 119/Midway Road intersection is not in place prior to the site preparation or earth–moving activities of the Western MSCC project, the project owner shall provide traffic control at the SR 119/Midway Road intersection during construction of the Western MSCC project through the use of a policeman/flagman during peak traffic hours. The project owner shall provide traffic control during the construction phase of the Western MSCC project until the traffic signal is installed.

Protocol: The use of a policeman/flagman requires that a Traffic Control Plan be submitted to Caltrans.

Verification: At least 30 days prior to site mobilization, the project owner shall submit a Traffic Control Plan to Caltrans for approval. The project owner shall provide the CPM a copy of a letter from Caltrans acknowledging approval of the Traffic Control Plan at least 15 days prior to site mobilization.

TRANS-9 Prior to start of site mobilization for development of the Western MSCC project, the project owner shall make all necessary arrangements to allow the use of the Union Pacific Buttonwillow Branch rail line for delivery of construction materials and export of construction and demolition debris. The rail line will be used whenever possible and cost effective.

Protocol: The project owner shall reach an agreement with the owner of the rail line to make necessary repairs to the line and to permit use of the line for the purposes described above.

Verification: At least 120 days prior to start of site mobilization for development of the Western MSCC project, the project owner shall reach an agreement with the owner of the rail line to make necessary repairs to the line and to permit use of the line for the purposes described above.

REFERENCES

CAL-TRANS (California Dept. of Transportation/J. Sorenson) 2000a. Caltrans Review/Comments of the Proposed Project. Submitted to the California Energy Commission/E. Allen on March 24, 2000.

California Department of Transportation (Caltrans), 1998 Traffic Volumes on California State Highways, June 1999.

CEC (California Energy Commission/Caswell) 2000z. Summary of the April 13, 2000 Data Request Workshop #1. Submitted to the Workshop participants on April 28, 2000.

CEC (California Energy Commission/Caswell) 2000a6. Summary of the May 15, 2000 Data Response Workshop #1 Regarding the Western Midway Sunset Cogeneration Company Project. Submitted to the Workshop Participants on May 18, 2000.

Elk Hills Power LLC, Elk Hills Power Project Application for Certification, February 1999.

Kern County, Kern County General Plan Circulation Element, 1992.

Midway (Western Midway Sunset Co) 1999a. Application for Certification. Submitted to the California Energy Commission/Smith on December 22, 1999.

Midway (Western Midway Sunset Co) 2000o. Supplemental AFC Material #2 (Supplementary information previously submitted on February 18, 2000, February 22, 2000, February 23, 2000 and February 25, 2000) (Attachment: Proof of Service) Submitted to the California Energy Commission on March 2, 2000.

Midway (Western Midway Sunset Co./Western) 2000s. Data Requests Responses 1-53 * POS 10 Electronic Data files. Submitted to California Energy Commission/Dockets on May 5, 2000.

Nienke, Barry, Kern County Road Department, Telephone Conversation.

Register, Terry, WZI Inc., Telephone Conversation on June 30, 2000 concerning assumptions in the Traffic and Transportation Analysis for the Western MSCC Project.

Sunrise Cogeneration and Power Company, Sunrise Cogeneration and Power Company Application for Certification, 1998.

WZI (WZI/Wilson) 2000b. Letter concerning assumptions in the Traffic and Transportation Analysis for the Western MSCC Project. Submitted to the California Energy Commission/Caswell on July 5, 2000.

WZI (WZI/Wilson) 2000c. PSA Comments. Submitted to the California Energy Commission/Caswell on September 8, 2000.

NOISE

Testimony of Thomas M. Murphy

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 that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would exhibit significant adverse environmental impacts.

The purpose of this analysis is to identify and examine the likely noise impacts from the construction and operation of the Western Midway Sunset Cogeneration Company Project (Western MSCC), and to recommend procedures to ensure that the resulting noise impacts would be adequately mitigated to comply with applicable laws and ordinances. This analysis will enable the Energy Commission to make findings that:

- the Western MSCC project would likely be built and operated in compliance with all applicable noise laws, ordinances, regulations and standards (LORS); and
- the Western MSCC project would present no significant adverse noise impacts, or none that have not been mitigated to the extent feasible.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time that the worker is exposed (see **Noise: Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves: monitoring the noise to which workers are exposed; assuring that workers are made aware of overexposure to noise; and periodically testing the workers' hearing to detect any degradation.

There are no federal laws governing offsite (community) noise.

STATE

California Government Code Section 65302(f) encourages each local government entity to perform noise studies and implement a noise element as part of their General Plan. In addition, California Code of Regulations, Title 4, has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in Table 1.

Table 1 Land Use Compatibility for Community Noise Environment

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE - Ldn or CNEL (db)													
	50		55		60		65		70		75		80	
Residential – Low Density Single Family, Duplex, Mobile Home														
Residential – Multi-Family														
Transient Lodging - Motel, Hotel														
Schools, Libraries, Churches, Hospitals, Nursing Homes														
Auditorium, Concert Hall, Amphitheaters														
Sports Arena, Outdoor Spectator Sports														
Playgrounds, Neighborhood Parks														
Golf Courses, Riding Stables, Water Recreation, Cemeteries														
Office Buildings, Business Commercial and Professional														
Industrial, Manufacturing, Utilities, Agriculture														

	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

Source: State of California General Plan Guidelines, Office of Planning and Research, June 1990.

Other State LORS include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Administration (Cal-OSHA) regulations.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3) require that the lead agency disclose all potentially significant impacts associated with the proposed project. Specifically, a significant effect from noise may exist if a project would result in:

"a) 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.

"b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels.

"c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

"d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project…."

CAL-OSHA

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (California Code of Regulations, Title 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards **(see NOISE: Appendix A, Table A4).**

LOCAL

KERN COUNTY GENERAL PLAN NOISE ELEMENT

Two policies in the Kern County General Plan Noise Element are applicable to construction and operation of the proposed project (Kern County, 1989). Policy (5) (a) prohibits new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce exterior noise levels to 65 dB L_{dn} or less. Policy (5) (b) prohibits new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into project design to reduce interior noise levels within living spaces or other noise sensitive interior spaces to 45 dB L_{dn} or less. Table 2 lists the established maximum desired ambient noise levels in Kern County as presented in the County's Noise Element. It should be noted that there are no current noise ordinances in Kern County.

Table 2 Maximum Desired Ambient Noise Levels

Land Use Category	L_{50} (Day)	L_{50} (Night)	L_{dn} (CNEL)
Insensitive Uses	65	60	75
Moderately Sensitive Uses	60	55	70
Sensitive Uses	55	45	65
Highly Sensitive Uses	50	40	60

Source: Kern County General Plan, Noise Element, December 1989

SETTING

PROJECT BACKGROUND

The proposed Western MSCC project involves the construction and operation of a new 500 MW natural gas-fired combined cycle power plant adjacent to the existing MSCC cogeneration facility in western Kern County. The proposed plant is conceptualized as two advanced "F" class combustion turbine generators and associated heat recovery steam generators (HRSGs). The HRSGs would be installed as a two-on-one configuration. The two HRSGs will raise steam to drive one reheat/condensing steam turbine generator.

The project would be supplied by two existing natural gas pipelines (Kern/Mojave Pipeline and Southern California Gas) that currently serve the existing MSCC facility. The Applicant proposes to construct a new 19-mile 230,000-volt (230kV) transmission line parallel to and within the existing 230kV line corridor that connects the existing cogeneration plant to PG&E's Midway Substation. Other proposed construction activities include development of a water supply pipeline, stormwater facilities, roads, and a sanitary leach field.

EXISTING LAND USE

POWER PLANT SITE

The proposed Western MSCC project would be located in western Kern County, approximately 40 miles west of Bakersfield, California. The proposed project site is adjacent to and west of the existing MSCC Plant located at the foot of Crocker Canyon. This facility site is zoned for Exclusive Agriculture ("A"), and is authorized under the Kern County General Plan land use designations as "Mineral Petroleum Use (compatible with intensive agriculture)." Existing land uses in the study area consist of an existing oil and gas production field and undeveloped lands. The heavily used oil and gas production field, which is operated by Aera Energy, borders the proposed plant site to the east. Undeveloped lands border the site on the west, north, and south.

No sensitive receptors are located within the one-mile study area of the proposed Western MSCC site. The closest sensitive receptors are approximately two miles from the site. Residences in Derby Acres are approximately 2.5 miles northeast of the site. In addition to Derby Acres, oilfield residences in Seneca Resources are approximately two miles east of the site within the oil and gas production field (WMSCC 1999a, AFC § 5.9.1.2.1).

It should be noted that there is a small ranch house located approximately one and a half miles to the west of the facility within Crocker Canyon (WMSCC 1999a, AFC § 5.12.1.2). However, this residence is used seasonally (short periods of time) for cattle related activities. This small ranch house was not considered a sensitive receptor because of the distance and because it is not used a majority of the time.

LINEAR FACILITIES

The proposed Route 1 Transmission Line route would be parallel to the existing 230kV line, located entirely within Kern County. The transmission line right-of-way (ROW) is zoned for Exclusive Agriculture ("A") and Limited Agriculture ("A-1"), and is authorized under the Kern County General Plan land use designations as "Intensive and Extensive Agricultural/Mineral Petroleum." Existing land uses within the one-half mile transmission line corridor (one-quarter mile on each side) consist of undeveloped lands, oil fields, Bureau of Land Management (BLM) lands, the California Department of Fish and Game lands, the California Aqueduct, levees, flood canals, and agricultural fields (Western MSCC 1999a, AFC § 5.9.1.3). The transmission route crosses approximately 2.6 miles of land that have been modified by oil production activity, 10.8 miles of uncultivated/fallow fields that may be abandoned agricultural land used as pasture, 4.2 miles of irrigated agricultural land, 0.2 miles of land within PG&E's Midway Substation area, and BLM lands. The proposed transmission line route passes within one mile of two communities: McKittrick and Buttonwillow. The proposed transmission line route crosses several transportation routes, including State Highway 33, Skyline Road, Mirasol Avenue, Buerkle Road, and State Highway 58 (WMSCC 1999a, AFC § 5.9.1.3.1).

Sensitive receptors within one-half mile of the transmission line corridor include residential, recreational and educational land uses. The sensitive residential receptors include the community of Buttonwillow, which is located approximately 0.5 mile north of the proposed transmission line route. In general, the route passes within 0.25 mile of approximately 14 residences. Buttonwilow Park is located 0.5 mile west of the proposed route. The McKittrick School and Buttonwillow Union School are located 0.8 mile west and 0.8 mile northwest of the proposed route, respectively (WMSCC 1999a, AFC § 5.9.1.3.2).

PIPELINE

The proposed Western MSCC project would require one new pipeline to provide water for the cooling towers. The proposed pipeline route is 1.8 miles long and would follow existing pipeline routes. The half-mile pipeline corridor is zoned as Exclusive Agriculture ("A"), authorized under the Kern County General Plan as "Mineral and Petroleum" (WMSCC 1999a, AFC § 5.9.1.5). Existing land uses within the study area consist of 1.8 miles of land that has been modified by oil production activity (WMSCC 1999a, AFC § 5.9.1.5.2).

Nearby sensitive receptors located outside of the study area include four residences. The residences are approximately 1,500 feet north of the proposed pipeline route terminus (WMSCC 1999a, AFC § 5.9.1.5.3).

EXISTING NOISE LEVELS

In order to predict the likely noise effects of the proposed project on adjacent sensitive receptors, the Applicant commissioned RAM Environmental Engineering Services to conduct an ambient noise survey of the area. The survey was conducted at three locations for 38 hours between November 12 and November 14,1999 using Quest, Model M-27 noise recording dosimeters (WMSCC 1999a, AFC § 5.12.1.3). It should be noted that a fourth monitoring location recorded 39 hours of noise measurements between November 12 and November 14, 1999.

The Applicant's noise survey monitored noise levels at the following four locations: 1) 23312 Bakers Street, Derby Acres; 2) the Seneca Resources residences located approximately 2 miles east of the proposed Western MSCC site; 3) at a location 300 feet south of the southwest corner of the proposed facility; and 4) northeast corner of the proposed facility.

The average ambient noise level recorded at the first monitoring location (23312 Bakers Street, Derby Acres) was 51.8 dBA L_{eq}. The monitor recorded a relatively steady-state noise level of 50 dBA during nighttime hours, and a noise range of 50 to 66 dBA during daytime hours (WMSCC 1999a, AFC § 5.12.1.3). The primary noise source in the area was vehicle traffic along State Highway 33.

Noise results for the second monitoring location (residences at Seneca Resources) averaged 53.6 dBA L_{eq} for the monitoring period. The highest hourly noise levels occurred during the mid-day hours (11 a.m. to 2 p.m.). The primary noise source in the area was from industrial operations at the oil and gas-processing field.

The ambient noise level readings for the third monitoring location (southwest corner of the Western MSCC site) indicated a prolonged period from 3 p.m. to 10 a.m. where noise levels ranged between 50 to 52 dBA L_{eq}. However, from 10 a.m. to 3:00 p.m. on November 13, noise levels ranged between 54 dBA and 57 dBA L_{eq}. The average noise level over the 38-hour period was 51.0 dBA L_{eq}.

The fourth monitoring location (northeast corner of the facility) experienced noise levels between 54 dBA and 66 dBA L_{eq} throughout the 39-hour monitoring period. The average decibel level was 56.8 dBA L_{eq} (WMSCC 1999a, AFC §5.12.1.3).

IMPACTS

Noise impacts associated with the proposed project can be created by short-term construction activities, and by normal long-term operations of the power plant.

PROJECT SPECIFIC IMPACTS — CONSTRUCTION

COMMUNITY EFFECTS

Construction noise is a temporary phenomenon; the construction period for the proposed Western MSCC Project is scheduled to last for 20 months (WMSCC 1999a, AFC § 5.12.1.3). Construction of an industrial facility such as a power plant

is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempt from enforcement by local ordinances. It should be noted that there are no specific LORS that limit construction noise in Kern County.

The Applicant has predicted the potential noise impacts of site mobilization on the nearest sensitive receptors (WMSCC 1999a, AFC § 5.12.2.1; Figure 5.12-2). Sound levels at fifty feet from the acoustic center of the proposed construction activities would range from approximately 85 to 90 dBA. Noise levels at the closest residence 10,500 feet from the construction site are projected to reach about 40 to 45 dBA for most work. Ambient background noise levels at the residences are projected to be between 50 to 60 dBA L_{eq}. As a result, noise levels at the residence would not be noticeable based on the noise survey results.

Because construction activity and related traffic are scheduled during the daytime hours, potential construction impacts to receptors in either the Seneca Resources residential area or in Derby Acres associated with the proposed project are considered to be less than significant (WMSCC 1999a, AFC § 5.12.2.1).

STEAM BLOWS

Typically, the steam blows create the loudest noise encountered during construction. Steam blows are necessary after erection and assembly of the feedwater and steam systems because the piping and tubing that comprises the steam path accumulate dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were to start up without thoroughly cleaning out the piping and tubing, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. High pressure steam is then raised in the heat recovery steam generator (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 effective at cleaning out the steam system. 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.

Typically, steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. This would attenuate to approximately 90 dBA, an exceedingly disturbing range, at the nearest residence, 10,500 feet in distance. In order to minimize disturbance from steam blows, the steam blow piping can be equipped with a silencer that would reduce noise levels at the nearest residence by 20 to 30 dBA, or to a level ranging from 60 dBA to 70 dBA, respectively. Because this undertaking may still produce an annoying noise level, staff proposes that any high pressure steam blows be muffled with an appropriate silencer, and be performed only during restricted daytime hours (see proposed Condition of Certification **NOISE-4** below) in order to minimize annoyance to residents.

Alternatively, the Applicant may elect to employ a new, quieter steam blow process, referred to as QuietBlow™ or Silentsteam™. This method utilizes lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 82 dBA at 100 feet; noise levels at the nearest residence would thus be approximately 42 dBA, less than the ambient background noise level.

Regardless of which steam blow process the Applicant selects, staff proposes a notification process (see proposed Condition of Certification **NOISE-5** below) to make neighbors aware of scheduled steam blows. This should help ensure the process is at least tolerable to residents.

LINEAR FACILITIES

Construction of the transmission line, Midway Substation, and the 16-inch waterline would produce noise. This noise would be noticeable, and possibly annoying, to persons outside their homes at those residences nearest the construction area. For residences 1,000 feet from the transmission line route (and tower construction activity), the construction noise level would be approximately 59 dBA L_{eq} due to the distance from the noise source. Thus, this construction noise would be above the ambient noise of approximately 50 to 55 dBA L_{eq} considered typical for daytime noise levels in the vicinity of residential land uses (and previously measured at the plant site). Transmission line construction noise levels expected at Buttonwillow Park are just under 50 dBA L_{eq} (WMSCC 1999a, AFC § 5.12.2.5). This work, however, would only be temporary in nature and would progress at such a pace that no single receptor would be inconvenienced for more than a few days. In addition, such work is customarily performed during the daytime, and would not cause any impacts at night, when lower noise levels are important to limit sleep interference. 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**, **NOISE-2** and **NOISE-8**, below) that would allow any person experiencing annoying noise to address the problem with the Applicant. Staff believes no significant adverse noise impacts are likely to occur due to the construction of the linear facilities.

WORKER EFFECTS

The Applicant does not specifically acknowledge the need to protect construction workers from noise hazards. The Applicant does, however, recognize those applicable LORS that would protect construction workers, and commits in general to complying with them (WMSCC 1999a, AFC §§ 5.12.5, 7.5.12). To ensure that construction workers are, in fact, adequately protected, staff has proposed a Condition of Certification (**NOISE-3**, below).

PROJECT SPECIFIC IMPACTS — OPERATION

COMMUNITY EFFECTS

The Applicant has committed to incorporating noise mitigation measures into the design of the project to ensure that noise levels at the nearest receptor (10,500 feet in distance) would not increase substantially. In fact, according to Figure 5.12-2 of

the AFC, projected noise levels at the closest residential receptor during normal facility operations were found to be well below the existing ambient noise levels. Specifically, predicted facility noise emissions during normal operations were determined to be 25 dBA at Seneca Resources and approximately 20 dBA at Derby Acres (WMSCC 1999a, AFC §§ 5.12.2; 5.12.5.4). These levels are well below the existing ambient noise levels. As a result, no significant noise impacts are anticipated from the operation of the Western MSCC facility.

POWER PLANT OPERATION

During its operating life, the Western MSCC facility would represent essentially a steady, continuous noise source day and night. Occasional short-term increases in noise levels would 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 would decrease.

The primary noise sources anticipated from the proposed facility include the steam turbine generator, gas turbine generators, heat recovery steam generators, transformers, cooling tower, boiler feed pumps, 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.

It should be noted that the proposed power plant is located adjacent to and west of the existing Midway Sunset Cogeneration Company (MSCC) site. No sensitive receptors are located to the west, north, or south of the proposed site. As described previously, the closest sensitive receptor is located at a distance greater than 1.8 miles to the east, with limited line of sight between the source (i.e., power plant) and the receiver (sensitive receptor). In addition, it is assumed that the noise generated from the new power plant would be slightly shielded or masked by the existing power plant adjacent to and east of the proposed Western MSCC project. The primary noise experienced by the sensitive receptor will be from oil and gas processing operations located between the sensitive receptor and the new power plant location, as well as from noise generated from vehicle traffic along State Route 33.

The Applicant modeled facility noise emissions using ENM noise prediction software. The software uses individual equipment noise level estimates and USGS digital topography maps to estimate noise levels. Potential noise sources are divided into point, line, plane or surface sources. Acoustic data were modeled in octave form. All modeling information was based on standard manufacturer performance data for the major equipment planned for the proposed facility (WMSCC 1999a, AFC § 5.12.2.2). The modeled noise level at the closest residential receptor associated with the Western MSCC project was well below the existing ambient noise conditions. As a result, staff believes that no significant adverse noise impacts are likely to occur due to the operation of the project. It should be noted that the proposed Condition of Certification **NOISE-6** would ensure

that the noise levels at the closest receptor (i.e., Seneca Resources) would not be any greater than the specified noise level of 58.6 dBA L_{eq}.

TONAL AND INTERMITTENT NOISES

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds that, while not louder than permissible levels, stand out in sound quality. The Applicant predicts that the tonals, which could be audible offsite, would be tones from the additional transformers at the substation. This particular noise would be indistinguishable from the transformer noise presently generated at the existing substations. Therefore, the incremental increase in noise levels is not likely to be perceived at any adjacent use. Noise generated by the operation of the substation is expected to be below significant levels at all noise-sensitive receptors (WMSCC 1999a, AFC § 5.12.2.6).

LINEAR FACILITIES

A proposed 16-inch waterline would be constructed on existing aboveground pipe sleepers at a distance of 1.8 miles. Noise levels would not be impacted by the waterline operation. However, short-term noise level increases would occur because of maintenance activities. Negligible impacts are expected as a result of project maintenance activities.

In addition to the pipeline, the proposed facility would require a 230 kV transmission line parallel to the existing transmission line. Audible transmission line noise is generated from corona discharge, which is experienced as a random crackling or hissing sound. Corona discharge occurs when particles, such as dust or water droplets, come into contact with a conductor. The potential for noise from corona discharge is greater during wet or windy weather than during dry, calm weather. The noise expected from the conductors would be inaudible at distances greater than 50 feet from the conductor bundle except under high humidity or wet conditions.

The noise stemming from the substation is produced by the high voltage transformers and shunt reactors. The noise could be audible off site but is expected to be below significant levels at the nearest receptor (WMSCC 1999a, AFC § 5.12.2.6).

WORKER EFFECTS

The Applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and has committed to comply with applicable LORS (WMSCC 1999a, AFC §§ 5.12.3, 7.5.12). Areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing) would be posted and hearing protection would be required. The Applicant would implement a comprehensive hearing conservation program.

CUMULATIVE IMPACTS

Cumulative impacts are defined as those impacts that are created because of the combination of the project evaluated in the EIR together with other projects causing

related impacts. The *CEQA Guidelines* require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the proposed project alone.

The *CEQA Guidelines* also mandate two different ways in which cumulative impacts are to be evaluated. One of these mandated approaches is to summarize growth projections in an adopted general plan or in a prior certified environmental document. The second method involves compilation of a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

There are no other existing noise sources or planned projects that could contribute to cumulative noise impacts in the project study area. The nearest planned projects are the Sunrise Cogeneration Power Project approximately three miles to the east and the La Paloma Power Project to the north currently under construction. These projects are not expected to contribute to significant cumulative noise impacts (WMSCC 1999a, AFC § 5.12.2.7).

FACILITY CLOSURE

Upon closure of the proposed facility, all operational noise would cease and no further adverse impacts from operation would be possible. The remaining potential noise source would be that caused by dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction of the Western MSCC, 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 that are 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 proposed Western MSCC facility will be built and operated to comply with all applicable noise laws, ordinances, regulations, and standards. Staff further concludes that if the proposed Western MSCC facility were mitigated as described above, it will not produce significant adverse noise impacts.

RECOMMENDATIONS

Staff recommends that the following proposed Conditions of Certification be adopted to ensure compliance with all applicable noise LORS, and implementation of the Applicant's proposed mitigation measures listed in Section 5.12.3.1 of the Application for Certification.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of site mobilization or ground-disturbance, the project owner shall notify all residents within one-half mile of the site or adjacent to the linear facilities, by mail or other effective means, of the commencement of site mobilization. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the telephone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: The project owner shall transmit to the Energy Commission Compliance Project Manager (CPM) in the first Monthly Compliance Report following the start of site mobilization 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 project, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner or authorized agent shall:

- use the Noise Complaint Resolution Form (see below for example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise related to the complaint;
- if the noise is project related, take all feasible measures to reduce the noise at its source; and
- submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the 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 the Kern County Environmental Health Department, and with the CPM, documenting the resolution of the complaint. If mitigation is required

to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-3 Prior to the start of site mobilization, 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 and Cal-OSHA standards.

Verification: At least 30 days prior to the start of site mobilization, 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 110 dBA measured at a distance of 100 feet. The project owner shall conduct steam blows only during the hours of 8 a.m. to 5 p.m., unless the CPM agrees to longer hours based on a demonstration by the project owner that offsite noise impacts will not cause annoyance. If a 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 the noise levels expected, and a description of the steam blow schedule. At least 15 days prior to any 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 projected time schedule for execution of the process.

NOISE-5 At least 15 days prior to the first steam blow(s), the project owner shall notify all residents within two miles of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. 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: 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 Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 38-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 source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints. If the results from the survey indicate that the project noise levels [averaged over 38-hours between 6 p.m. and 7 a.m. (Friday through Sunday)] at the closest sensitive receptor are in excess of 58.6 dBA Leq, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

Verification: Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the Kern County Environmental Health Department, and to 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 30 days after the facility is in full operation, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. 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 and Cal-OSHA upon request.

NOISE-8 Noisy construction work (that which causes off-site annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the times of day delineated below:

High-pressure steam blows:	8 a.m. to 5 p.m.
Other noisy work	7 a.m. to 10 p.m.

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.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Western MSCC Energy Facility
(99-AFC-9)

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 from noise source _____ dBA Date: _____

Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at 3 feet from noise source: _____ 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).

REFERENCES

Barnes, J.D., L.N. Miller, and E.W. Wood. 1976. Prediction of Noise from Power Plant Construction. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Empire State Electric Energy Research Corporation, Schenectady, New York.

Beranek, L.L., I.L. Ver. 1992. *Noise and Vibration Control Engineering:Priniciples and Applications*. John Wiley and Sons, August.

Cunniff, Patrick F., *Environmental Noise Pollution*. John Wiley & Sons, 1992.

DHS (California Department of Health Services), Office of Noise Control. *Model Community Noise Control Ordinances*, 1977.

Edison Electric Institute. *Electric Power Plant Environmental Noise Guide*, 1984.

Kern County. 1989. Kern County General Plan, Noise Element. December.

Kryter, Karl D. *The Effects of Noise on Man*. Academic Press, N.Y., 1970.

Miller, L.N., E.W. Wood, RM. Hoover, A.R. Thompson, and S.L. Paterson. 1978. Electric Power Plant Environmental Noise Guide, Volume 1. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Edison Electric Institute, New York, New York.

Office of Planning and Research. 1990. State of California General Plan Guidelines. June.

Peterson and Gross (Peterson, Arnold P. G. and Ervin E. Gross, Jr.). *Handbook of Noise Measurement*, 7th ed. GenRad, Concord, MA., 1974.

Smith, B.J., R.J. Peters, S. Owens. 1996. Acoustics and Noise Control, 2nd Edition. Addison-Wesley. November

U.S. EPA. 1971. *Noise from Construction Equipment and Operations*. Prepared by Bolt et al. Beranek, and Newman, Boston, MA. December

U.S. EPA. 1971. *Community Noise*. Washington D.C., December

U.S. EPA. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. 550/9-74-004. U.S. Environmental Protection Agency, Office of Noise Abatement and Control. Washington, DC.

U.S. EPA . 1978. *Protective Noise Levels, (Condensed Version of EPA Level Document)* (No. PB82-138827).

Western Midway Sunset Cogeneration Company (WMSCC). 1999a. Application for Certification, Western Midway Sunset Cogeneration Company Project (99-AFC-9), Volumes 1, 2, and 3. Submitted to the California Energy Commission, December 1999.

Western Midway Sunset Cogeneration Company (WMSCC). 1999b. Application for Certification, Western Midway Sunset Cogeneration Company Project (99-AFC-9), Supplemental Information. Submitted to the California Energy Commission, February 9, 2000.

Western Midway Sunset Cogeneration Company (WMSCC). 1999c. Application for Certification, Western Midway Sunset Cogeneration Company Project (99-AFC-9), Supplemental Information #2. Submitted to the California Energy Commission, March 2, 2000.

NOISE: APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. Table A1 provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (Leq), or by day and night levels with a nighttime increase of 10 dBA (Ldn). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45-to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. In wilderness area, the Ldn noise levels average approximately 35 dBA , 50 dBA in small towns or wooded residential area, 65 to 75 dBA in major metropolis downtown (e.g., Los Angeles), and 80 to 85 dBA near freeways and airports. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban area than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural area away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects (USEPA, 1971). At 70 dBA, sleep interference effects become considerable.

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 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.
L10, L50, & L90	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L90 is generally taken as the background noise level.
Equivalent Noise Level L_{eq}	The energy 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.	

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		
Very Loud Music	110	Rock Music Concert	Very Loud
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')	90	Boiler Room	Very Loud
Freight Cars (50')	85		
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
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

SOUND AND DISTANCE

- Doubling the distance from a noise source reduces the sound pressure level by 6 dB.
- Increasing the distance from a noise source ten times reduces the sound pressure level by 20 dB.

Worker Protection

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 Regulation

VISUAL RESOURCES

Testimony of David Flores

INTRODUCTION

Energy Commission staff analyzed both the potential visual impacts of the proposed Western Midway Sunset Cogeneration Company Project (Western MSCC) and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the project with the mitigation measures identified in this analysis will not cause significant adverse visual impacts. Examples of proposed mitigation measures are light reflectors and color treatment of the power plant and power poles. Also, the project after mitigation will not conflict with local policies regarding visual resources that are part of the applicable laws, ordinances, regulations, and standards.

PURPOSE

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether the Western MSCC project will cause significant adverse visual impacts and whether the project would be in conformance with applicable laws, ordinances, regulations, and standards. 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) Public Resources Code section 21000 et seq. and Title 20, California Code of Regulations, section 1701 et seq.1 The determination of the conformance of the proposed project with applicable laws, ordinances, regulations, and standards is required by Public Resources Code, section 25525.

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- staff's analysis methodology;
- applicable laws, ordinances, regulations and standards;
- assessment of the visual setting of the proposed power plant site, including linear facility routes;
- evaluation of the visual impacts of the proposed project on the existing setting;
- evaluation of the project compliance with applicable laws, ordinances, regulations, and standards; and
- recommendation of measures needed to mitigate any potential significant adverse visual impacts of the proposed project and to achieve compliance with applicable laws, ordinances, regulations, and standards.

METHODOLOGY

The methodology used in this visual assessment is described below and includes a description of the approach and process used, identification of the criteria used for

visual assessment, and identification of the basis for identifying relevant significance criteria used in evaluating the impacts of the proposed project.

SIGNIFICANCE CRITERIA

Energy Commission staff considered the following criteria in determining whether a visual impact would be significant.

STATE

The CEQA Guidelines defines a "significant effect" on the environment to mean a substantial, 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, § 15382.)

Appendix G of the Guidelines, under Aesthetics, includes four questions to be addressed regarding whether the potential impacts of a project are significant. These questions ask whether the project would:

1. have a substantial adverse effect on a scenic vista;
2. substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
3. substantially degrade the existing visual character or quality of the site and its surroundings; or
4. create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

LOCAL

Energy 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. See the section on Applicable Laws, Ordinances, Regulations, and Standards.

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 eliminate or block views of valuable visual resources?
- Will the project result in significant amounts of backscatter light into the nighttime sky?

- Will the project be in conflict with directly identified public preferences regarding visual resources?
- 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?

KEY OBSERVATION POINTS

The applicant and Energy Commission staff selected six Key Observation Points (KOPs) to provide the basis for evaluation of project impacts by comparing the appearance before and after project construction. KOPs include locations that are chosen to be representative of the most critical locations from which the project would be seen.

EVALUATION PROCESS

For each KOP, Energy Commission staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. The applicant used Viewing Positions in the visual resources section of the application (MSCC 2000a). Energy Commission staff evaluated the appropriateness of these locations for its analysis and agreed with the selection of locations. Because the water supply line will be located within an existing pipeline corridor, KOPs were not identified for this feature.

ELEMENTS OF THE VISUAL SETTING

To assess the existing visual setting, staff considered the following four elements:

Visual Quality

The value of visual resources. This analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as "picture postcard" landscapes. "Low visual quality describes landscapes that are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting" (Buhyoff et al., 1994). For projects in an rural setting, visual quality typically ranges from high, such as for a park or major water view, to low, such as for an area of heavy industry.

Visual Sensitivity

A measurement of the level of interest or concern of viewers regarding the visual resources in an area. Official statements of public values and goals reflect viewers' expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer sensitivity. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are highly sensitive. Commercial uses, including business parks, are generally moderately sensitive, with landscaping, building height limitations, and prohibition of above-ground utility lines demonstrating concern for visual quality. Large-scale industrial uses are typically

the least sensitive because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Visibility

Visibility can differ substantially between view locations, depending on screening and the angle of view. The smaller the degree of screening, the higher a feature's visibility. The closer the feature is to the center of the view area, the greater its visibility.

Viewer Exposure

The degree to which viewers are exposed to a view is affected by distance, the number of viewers, and the duration of view. Viewer exposure can range from having high values for all three factors, such as a foreground view from a large number of residences, to having low values for all three factors, such as a brief background view for a few travelers.

TYPES OF VISUAL CHANGE

To assess the visual changes the project would cause, staff considered the following factors:

Dominance - One measure of change is scale dominance - the apparent size of an object relative to the visible expanse of the landscape and to the total field of view. Another measure of change is spatial dominance - the measure of the dominance of an object due to its location in the landscape. Dominance can range from subordinate to dominant.

Contrast - Visual contrast in regard to the elements of color, form, line, and scale.3. The degree of contrast can range from high to low.

View Blockage - View blockage is the blockage from view or elimination by the project of any previously visible components. Blockage of higher quality visual elements by lower quality elements causes adverse impacts. The degree of view blockage can range from strong to none.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL AND STATE

The proposed project, including the linear facilities, is located on private lands and is thus not subject to federal land management requirements. Likewise, 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

KERN COUNTY GENERAL PLAN

Kern County has no specific policies on visual or aesthetic resources that apply to the Midway Sunset 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. In accordance with Chapter 19.86 of the Kern County Zoning Code, the applicant is required to prepare a Landscape Plan when final construction drawings of the project are completed.

PROJECT DESCRIPTION

The proposed Western MSCC project will be a nominal 500-megawatt (MW), natural gas-fired combined cycle power plant to be located along the north side of West Crocker Springs Road, approximately 3 miles west of State Route 33 and 6 miles northwest of the community of Fellows, 2.5 miles southwest of the community of Derby Acres, and 6 miles south of the community of McKittrick.

WATER SUPPLY LINE

A 16-inch, 1.8-mile long above ground water supply pipeline will be installed from the plant site to the West Kern County Water District distribution facility (line number 303). The water line will follow an existing right-of-way and will rest on existing pipe supports, or be built on supports immediately adjacent within the existing corridor. From staff's perspective, the pipeline will be seen in the context of the existing oil and gas facilities and would not produce a significant change in visual conditions.

NATURAL GAS PIPELINE

The natural gas piping will extend from the existing MSCC facility to the proposed power plant facility. Because the pipeline will be within the footprints of the existing plant and the proposed plant, it will not be prominently visible from publicly accessible areas. Visual impacts during construction would not be significant.

TRANSMISSION LINE

The Western MSCC project will interconnect with the Midway Substation, located east of Buttonwillow. The proposed 230 kV transmission route is within the preexisting MSCC transmission corridor. The new 19-mile line parallels an existing line that originates at the adjacent cogeneration plant. From the proposed plant site, the proposed transmission line heads north across the Telephone Hills and terminates at the Midway Substation.

SETTING

REGIONAL SETTING

The project site lies about 40 miles west of Bakersfield along the southwestern edge of the San Joaquin Valley. The project site is in the Crocker Canyon on the southwestern border of the valley at the base of the Temblor Mountains. The climate is arid, and the hills are covered with a mantle of low growing annual grasses with patches of saltbush scrub and alkali sink scrub. This area has been subject to intensive oil and gas exploration since the early part of the 20th century, and the natural landscape has been modified extensively. A network of access roads, terraced drilling areas, oil pumps, above ground pipelines, and storage tanks crisscross the hills in the area of the project site. Oil and gas processing facilities are all prominently visible within the landscape pattern.

As provided in the Application for Certification, the small number of residences scattered through this area tend to be ranch homes rather than non-farm rural residences, and residential uses are secondary to this area's oil production function. Roads, canals, power lines, agricultural storage facilities and oil production facilities are very prominent and little natural vegetation or natural landscape is visible.

Communities in the project area include McKittrick, and Buttonwillow. Derby Acres a small-unincorporated residential community is located along Highway 33 in the Buena Vista Valley, which lies along the southern edge of the Elk Hills range.

Buttonwillow is an unincorporated community located on the flat lands approximately four miles north of the northern edge of the Elk Hills range. Buttonwillow is the largest of the communities in the project area and consist of residential homes and commercial service centers for the surrounding agricultural operations in the area.

PROJECT AREA SETTING

The plant site is located on a gentle rounded east to west trending ridge on the floor of Crocker Canyon. The steep northeast facing slopes of the Temblor Range bound Crocker Canyon on the south and the rounded south facing slopes of the Telephone Hills on the north. The proposed site is immediately adjacent to an existing cogeneration plant. The main structures of the cogeneration plant include exhaust stacks, fin-fan units, water tanks and transmission poles and lines. Facilities related to the Midway Sunset Oil Field are located immediately adjacent to the site to the east. The oil facilities include pumping units, processing facilities, tanks, steam generators, surface piping, water recovery plants, and paved and unpaved roads.

IMPACTS

CONSTRUCTION IMPACTS

PROJECT SITE

The period of construction for the main site and offsite utility installation is expected to be about 24 months and would entail heavy construction equipment, temporary office facilities, a laydown and storage area, and truck traffic. The power plant site is sufficiently far from residences that visual impacts due to construction of the power plant would not be significant.

ELECTRICAL TRANSMISSION LINES

Construction activities for the 19-mile transmission line would involve drilling holes for tower foundations, installation of the foundation reinforcement and structure anchoring equipment, the placement of concrete for foundations, and the installation of the steel poles.

Construction of the transmission line and transition stations would take approximately six months to complete and would occur within the overall timeframe for the construction activities at the power plant site. Due to the temporary and changing location of this work, construction impacts would be less than significant.

LIGHTING

Although the proposed power plant is in an industrial area, existing lighting levels are generally low in the immediate vicinity. Exterior lighting for the proposed power plant therefore has the potential to considerably increase lighting levels, creating glare, backscatter to the nighttime sky, and illumination of visible plumes. The applicant has proposed measures to reduce such impacts, and Energy Commission staff has expanded these measures in the proposed conditions of certification.

KEY OBSERVATION POINTS

As provided in the AFC (AFC pg. 5.13-8, Section 5.13.1.6.3), the consultant structured the analysis of the project effects by identifying the view areas most sensitive to the project's potential visual impacts, and in consultation with Energy Commission staff, six Key Observation Points (KOPs) were selected for the development of photo simulations that could be used as a basis for visualizing the plant's potential effects. This analysis focuses on viewers who are highly sensitive to changes in the visual setting and on existing visual features that affect the visual quality, visibility, and visual exposure to the proposed project for those viewers. **VISUAL RESOURCES Figure 1** shows the location of the KOPs used in this analysis and the direction of each view.

Because the water supply and wastewater lines will be either underground or on the ground and will be either not visible or not highly visible, and because they will, for the most part be located within the 74 square mile boundaries of the Midway Oil and Gas Field, KOPs were not identified or defined for these features.

KEY OBSERVATION POINT 1 - POWER PLANT

KOP 1(see VISUAL RESOURCES Figure 1 for the location of KOP 1 and VISUAL RESOURCES Figures 2 & 2a for the view from KOP 1) represents the view located approximately 1,500 feet east of the proposed plant site on West Crocker Springs Road. The KOP represents the view of the plant site to the west as seen from a car on approach to the site from the east.

VISUAL SENSITIVITY

Because the viewers from this KOP will predominantly be oil field workers, MSCC plant employees, and some recreational users who access the Temblor Mountains to the west, visual sensitivity is considered low to moderate.

VISUAL RESOURCES Figure 1
Key Observation Points

VISIBILITY

The plant will be seen in the middleground view from West Crocker Springs Road, and will be partially obstructed by the existing power plant in the foreground, therefore visibility from KOP 1 will be moderate.

VISUAL QUALITY

The view from KOP 1 is that of an arid, open landscape devoted to oil and gas production and a cogeneration facility. Wooden power poles, oil pumps, surface pipelines, tanks, portable buildings, and heavy equipment are elements of the landscape scene. Because industry characterizes these views and no features of higher quality are present, visual quality in this view is low.

VIEWER EXPOSURE

Approximately 800 vehicles per day travel on West Crocker Springs Road (Kern County Department of Transportation Management, 1999). For workers and travelers on West Crocker Springs Road, considering the middleground distance, the small number of viewers and the short view duration, viewer exposure is low to moderate.

CONTRAST WITH STRUCTURES

The project structures would cause a low level of contrast in regard to form, line, color and texture with the existing cogeneration facility and oil field development in the foreground and middle-ground. Because the proposed exhaust stacks (130 feet high) would appear somewhat larger than the existing structures, the project would cause moderate scale contrast.

CONTRAST WITH VEGETATION

Vegetation visible in the view from KOP 1 towards the project site consist of a variety of seasonal grasses with an occasional greenish-yellow saltbush in the direct foreground. The project appears generally as a group of rectangles of varying proportions that would contrast strongly with the irregular shapes of vegetation, so the project would create a high level of contrast in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the seasonally green or tan tones of the vegetation in this view. Because the power plant would appear larger than the vegetation from KOP 1, the increment of contrast with vegetation added by the proposed structures would be substantial, and scale contrast with vegetation would be high. However, the proposed plant would only add incrementally to the contrast with vegetation caused by the existing cogeneration plant, existing electrical transmission lines, and oil development facilities in the area, therefore contrast with vegetation would be low.

CONTRAST WITH LAND AND WATER

No water is visible in this view. The landform consists of flat natural land with the Telephone Hills in the background and the Temblor Mountains in the distance. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. Natural

vegetation is visible, so color contrast would be moderate. The project size would appear small compared to the Telephone Hills in the background and Temblor Mountains in the distance, so contrast would be low.

Because of the distance of the project from KOP 1, and the presence of existing structures (existing power plant and electrical poles) in the view, the increment of contrast with the addition of the proposed structures would be moderate, reducing form and line contrast with land to moderate.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, therefore the proposed power plant would occupy a minor part of the setting. Scale dominance from KOP 1 would be subordinate.

SPATIAL DOMINANCE

Because of the spatial composition of the view from KOP1 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped by the hills and mountains, spatial dominance would be subordinate.

VIEW BLOCKAGE

From KOP 1, the project would block the view of a small part of the background hills that now can be seen. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant and stacks would not have a significant impact based on the following summary of visual factors for KOP 1:

- viewer sensitivity is low to moderate;
- visual quality is low;
- visibility is moderate;
- viewer exposure is low to moderate;
- the highest level of contrast would be moderate;
- scale dominance would be subordinate;
- spatial dominance would be subordinate; and
- view blockage would be low.

KEY OBSERVATION POINT 2- WEST CROCKER SPRINGS ROAD

KOP 2 **(see VISUAL RESOURCES Figure 1 for the location of KOP 2)** No photo or visual simulation is provided as the following analysis reflects the project would have no visual effect on the view from KOP 2. The analysis represents the view from approximately 440 feet west of the proposed power plant site on West Crocker Springs Road. The KOP was selected to represent the eastward view of the plant site as seen from a car on approach to the site from the west.

VISUAL SENSITIVITY

Because the viewers from this KOP will predominantly be oil field workers, MSCC plant employees, and some recreational users who access the Temblor Mountains to the west, visual sensitivity is considered low.

VISIBILITY

Because the view of the proposed power is largely unobstructed, visibility from KOP 2 is considered high.

VISUAL QUALITY

The view from KOP 2 is an arid, open landscape devoted to oil and gas production and gas processing facilities. Wooden power poles, oil pumps, surface pipelines, tanks, portable buildings, and heavy equipment are elements of the landscape scene. Because industry characterizes these views and no features of higher quality are present, visual quality in this view is low.

VIEWER EXPOSURE

Considering the foreground distance, the small number of viewers (800 vehicles per day) and the low to moderate duration of view, viewer exposure is low to moderate for KOP 2.

CONTRAST WITH STRUCTURES

The project structures would cause a low to moderate level of contrast in regard to form, line, color and texture with the existing cogeneration facility and oil field development in the foreground and middleground. Because the proposed exhaust stacks (130 feet) would appear somewhat larger than the existing structures, the project would cause moderate scale contrast.

CONTRAST WITH VEGETATION

Vegetation visible in the view from KOP 2 towards the project site consists of a variety of seasonal grasses with an occasional greenish-yellow saltbush in the direct foreground. The project appears generally as a group of rectangles of varying proportions that would contrast strongly with the irregular shapes of vegetation, so the project would create a high level of contrast in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the seasonally green or tan tones of the vegetation in this view. Because the power plant would appear larger than the vegetation from KOP 2, the increment of contrast with vegetation added by the proposed structures would be high, and scale contrast with vegetation would be high. However, the proposed plant would only add incrementally to the contrast with vegetation caused by the existing cogeneration plant, existing electrical transmission lines, and oil development facilities in the area, therefore contrast with vegetation would be low.

Contrast With Land And Water

No water is visible in this view. The landform consists of flat natural land with the Telephone Hills in the background and the Temblor Mountains in the distance.

Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. Sparse natural vegetation are visible, so color contrast would be low to moderate. The project size would appear small compared to the Telephone Hills in the background and Temblor Mountains in the foreground, so scale contrast would be low.

Because of the distance of the project from KOP 2, and the presence of existing structures (existing power plant and electrical poles) in the view, the increment of contrast with the addition of the proposed structures would be moderate, reducing form and line contrast with land to moderate.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, therefore the proposed power plant would occupy a minor part of the setting. Scale dominance from KOP 2 would be subordinate.

SPATIAL DOMINANCE

Because of the spatial composition of the view from KOP 2 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be back-dropped by the hills, spatial dominance would be subordinate.

VIEW BLOCKAGE

From KOP 2, the project would block the view of a small part of the background hills that now can be seen. Therefore, view blockage would be low.
VISUAL IMPACT
It can be concluded that the proposed power plant and stacks would not have a significant impact based on the following summary of visual factors for KOP 2:

- viewer sensitivity is low;
- visual quality is low;
- visibility is high;
- viewer exposure is moderate;
- the highest level of contrast would be moderate;
- scale dominance would be subordinate;
- spatial dominance would be subordinate; and
- view blockage would be low.

KEY OBSERVATION POINT 3- TRANSMISSION LINE-ELLIS ROAD

KOP 3 (see VISUAL RESOURCES Figure 1 for the location of KOP 3) No photo or visual simulation is provided as the following analysis reflects the project would have no visual effect on the view from KOP 3. The analyses represents the view of a portion of the transmission line looking north on Ellis Road just south of the intersection with State Highway 33. This KOP is also adjacent to two residences

which are located approximately 200 feet from the existing PG&E transmission line and 500 feet from the existing MSCC plant transmission line.

VISUAL SENSITIVITY

Because of the residences in the area of Key Observation Point 3, viewer sensitivity is high.

VISIBILITY

The transmission line will be visible from 2 homes on Ellis Road and travelers on State Highway 33, although the existing transmission lines will obscure the view of the new transmission line; therefore visibility for KOP 3 is low to moderate.

VISUAL QUALITY

The view from KOP 3 toward the proposed transmission line takes in the existing transmission lines in the foreground and oil field development on the hills. Because the view includes existing structures such as existing transmission lines and oil field developments, visual quality is low.

VIEWER EXPOSURE

Considering the foreground distance, the small number of viewers along State Route 33 (5,450 vehicles per day) and the small number of residences (3), duration of view is long for residences and low to moderate for travelers along State Highway 33. Overall viewer exposure is low to moderate for KOP 3.

CONTRAST WITH STRUCTURES

From KOP 3, the most prominent existing structures are the poles of the existing PG&E and MSCC transmission lines in the foreground. The proposed transmission line would include poles that would appear slightly shorter than the existing poles. The poles would be galvanized steel and similar in color with the existing lines. The poles would cause a low level of contrast in regard to form, line, color, texture and scale with the existing transmission facilities and oil field development in the foreground and middle-ground.

CONTRAST WITH VEGETATION

Vegetation visible in the view from KOP 3 towards the linear facilities consist of a variety of seasonal grasses with an occasional greenish-yellow saltbush in the direct foreground. The vertical from of the poles would contrast highly with the irregular form of the existing vegetation. 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 the green/brown tones of the vegetation. The power poles 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 AND WATER

No water is visible in this view. The landform consists of flat natural land with the Telephone Hills in the background and the Temblor Mountains in the distance. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. Sparse natural vegetation are visible, so color contrast would be low to moderate. However, the linear facilities would add incrementally to the contrast with land caused by the existing PG&E and MSCC transmission lines, 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 KOP 3 would be subordinate.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 3 is panoramic, the proposed linear facilities would be subordinate in regard to composition. Because the visible portions of the project would be back-dropped by the hills, spatial dominance would be subordinate.

VIEW BLOCKAGE

From KOP 3, with the panoramic view, the linear facilities would not block the view of the Telephone Hills and Temblor Mountains, so the proposed poles would only block a small portion of the field of vision. Therefore, view blockage would be weak.

VISUAL IMPACT

It can be concluded that the proposed linear facilities would not have a significant impact based on the following summary of visual factors for KOP 3:

- viewer sensitivity is high;
- visual quality is low;
- visibility is low to moderate;
- viewer exposure is low to moderate;
- the highest level of contrast would be low;
- scale dominance would be co-dominant;
- spatial dominance would be subordinate; and
- view blockage would be weak.

KEY OBSERVATION POINT 4- TRANSMISSION LINE/ RESERVE ROAD

KOP 4 (see VISUAL RESOURCES Figure 1 for the location of KOP 4) No photo or visual simulation is provided as the following analysis reflects the project would have no visual effect on the view from KOP 4. The analysis represents the view

from the east side of the town of McKittrick. The KOP is on the road adjacent to the eastern most residence.

VIEWER SENSITIVITY

Because of the residences in the area of Key Observation Point 3, viewer sensitivity is high. For oil field workers accessing the oil production sites, viewer sensitivity is low.

VISIBILITY

Because some views of the transmission line would be partially obscured by the existing transmission lines in the area, visibility is considered low to moderate.

VISUAL QUALITY

The view from KOP 4 is panoramic across the valley. The terrain in this area is generally flat, bounded on the northeast and southwest by hills. The vegetation is low grasses and shrubs and the view is unobstructed. Existing wooden electrical distribution lines and oil development facilities are in the foreground and middle ground. Visual quality is considered low to moderate for KOP 4.

VIEWER EXPOSURE

The transmission line will be visible to approximately 10 homes at the most easterly edge of the community of McKittrick. The transmission line will also be visible to approximately 220 vehicles per day on Reserve Road (Kern County Department of Transportation Management, 1999).

Considering the middle-ground distance from the KOP to the proposed transmission line, the small number of viewers from homes and vehicles, and the long duration of view, visual exposure for KOP 4 is moderate.

CONTRAST WITH STRUCTURES

From KOP 4, existing local electrical poles are in the foreground with the existing PG&E and MSCC transmission poles in the middleground. The proposed transmission line would include poles that would appear slightly shorter than the existing poles. The poles would be galvanized steel and similar in color with the existing lines. The poles would cause a low level of contrast in regard to form, line, color, texture and scale with the existing transmission facilities and oil field development in the middleground and background.

CONTRAST WITH VEGETATION

Vegetation visible in the view from KOP 4 towards the project site consists of a variety of seasonal grasses with an occasional greenish-yellow saltbush in the direct foreground. The vertical form of the poles would contrast highly with the irregular form of the existing vegetation. 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 the green/brown tones of the vegetation. The power poles 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 AND WATER

No water is visible in this view. The landform consists of flat natural land bounded on the northeast and southwest by hills. The proposed transmission poles would contrast highly with this land surface in regard to form and line. The gray tone color of the power 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. However, the linear facilities would add incrementally to the contrast with land caused by the existing local power lines and PG&E and MSCC transmission lines, 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 small in size compared to the panoramic field of view and would occupy a moderate part of the setting. Therefore, scale dominance from KOP 4 would be subordinate.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 4 is panoramic, the proposed linear facilities would be subordinate in regard to composition. Because the visible portions of the project would be back-dropped by the hills, spatial dominance would be subordinate.

VIEW BLOCKAGE

From KOP 4, with the panoramic view, the linear facilities would not block the view of the Telephone Hills and Temblor Mountains, so the proposed poles would only block a small portion of the field of vision. Therefore, view-blockage would be weak.

VISUAL IMPACT

It can be concluded that the proposed linear facilities would not have a significant impact based on the following summary of visual factors for KOP 4:

- viewer sensitivity is high for residences and low for oil field workers;
- visual quality is low to moderate;
- visibility is low to moderate;
- viewer exposure is moderate;
- the highest level of contrast would be low;
- scale dominance would be co-dominant;
- spatial dominance would be subordinate; and
- view blockage would be weak.

KEY OBSERVATION POINT 5-TRANSMISSION LINE/ BUERKLE ROAD

KOP 5 **(see VISUAL RESOURCES Figure 1 for the location of KOP 5 and VISUAL RESOURCES Figure 6 and 6a for the view from KOP 5)** is located on Buerkle Road in front of two residences. The view is westward and represents the view from the front yards of the residences and the view seen from cars traveling west on Buerkle Road.

VIEWER SENSITIVITY

Because of the residences in the area of KOP 5, viewer sensitivity is high. For laborers accessing the agricultural fields, viewer sensitivity is low.

VISIBILITY

The transmission line will be visible to approximately eight homes located in the vicinity of the intersection of Buerkle Road and Mirasol Avenue. The proposed transmission line route parallels Buerkle Road on the south side and crosses Mirasol Avenue. The transmission line will also be visible to approximately 130 vehicles per day on Buerkle Road (Kern County Department of Transportation Management, 1999). Because some views of the transmission line would be partially obscured by the existing transmission lines in the area, visibility is considered moderate.

VISUAL QUALITY

The view from KOP 5 is westward and takes in the existing local and transmission electrical distribution lines. Portions of the agricultural field that borders the road on both sides of the road are shown from this viewpoint. Because of the presence of rural residences, existing electrical distribution lines, the low number of vehicles traveling through this area, and agricultural landscape, visual quality is considered low to moderate.

VIEWER EXPOSURE

Considering the middle-ground distance of the proposed electrical distribution line from the existing residences, the small number of viewers (approximately 130 vehicles per day and scattered rural residences), viewer exposure is moderate and view duration is long. Considering these factors, viewer exposure is moderate for KOP 5.

CONTRAST WITH STRUCTURES

From KOP 5, existing local and regional electrical poles are in the foreground with the existing PG&E and MSCC transmission poles in the middleground. The poles would be galvanized steel and similar in color with the existing lines. The poles would cause a low level of contrast in regard to form, line, color, texture and scale with the existing transmission and regional facilities in the foreground and middle-ground.

CONTRAST WITH VEGETATION

Vegetation visible in the view from KOP 5 towards the project site consist of irrigated field and row crops in the foreground and middleground. The vertical form of the poles would contrast highly with the irregular form of the existing vegetation. 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 green tones of the vegetation. The power poles 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 AND WATER

No water is visible in this view. The landform consists of flat natural land and in the distance are hills. The proposed transmission poles would contrast highly with this land surface in regard to form and line. The gray tone color of the power 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. However, the linear facilities would add incrementally to the contrast with land caused by the existing local power lines and transmission lines, 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 small in size compared to the panoramic field of view and would occupy a moderate part of the setting. Therefore, scale dominance from KOP 5 would be co-dominant.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 5 is panoramic, the proposed linear facilities would be subordinate in regard to composition. Because the visible portions of the project would be back-dropped by the sky, spatial dominance would be prominent. The overall spatial dominance rating would be co-dominant, similar to the existing transmission lines.

VIEW BLOCKAGE

From KOP 5, with the panoramic view, the linear facilities would not block the view of the sky and distance hills, so the proposed poles would only block a small portion of the field of vision. Therefore, view blockage would be weak.

VISUAL IMPACT

It can be concluded that the proposed linear facilities would not have a significant visual impact based on the following summary of visual factors for KOP 5:

- viewer sensitivity is high for residence and low for local field laborers;
- visual quality is low to moderate;
- visibility is moderate;
- viewer exposure is moderate;

- the highest level of contrast would be low;
- scale dominance would be co-dominant;
- spatial dominance would be co-dominant; and
- view blockage would be weak.

KEY OBSERVATION POINT 6-TRANSMISSION LINE/ MIRASOL AVENUE

KOP 6 **(see VISUAL RESOURCES Figure 1 for the location of KOP 6 and VISUAL RESOURCES Figure 7 and 7a for the view from KOP 6)** is located on Mirasol Avenue in front of four residences. The view is northward and represents the view from the front yards of the residences and the view seen from cars traveling north on Mirasol Avenue.

VIEWER SENSITIVITY

Because of the residences in the area of KOP 6, viewer sensitivity is high. For farming laborers accessing the agricultural fields, viewer sensitivity is low.

VISIBILITY

The transmission line will be visible from four homes located on Mirasol Avenue. The proposed transmission line will cross Mirasol Avenue immediately north of the residences south of Buerkle Road. Because some views of the transmission line would be partially obscured by the existing transmission lines in the area, visibility is considered moderate.

VISUAL QUALITY

The view from KOP 6 is northward that takes in the existing local and transmission electrical distribution lines. Portions of the agricultural field that border on both sides of the road are shown from this viewpoint. Because of the presence of rural residences, existing electrical distribution lines, low number of vehicles traveling through this area, and agricultural landscaping, visual quality is considered low to moderate.

VIEWER EXPOSURE

Considering the middle-ground distance of the proposed electrical distribution line from the existing residences, the small number of viewers (approximately 630 vehicles per day (Kern County Department of Transportation Management, 1999) and scattered rural residences), viewer exposure is moderate and view duration is long. Considering these factors, viewer exposure is moderate for KOP 6.

CONTRAST WITH STRUCTURES

From KOP 6, existing local and regional electrical poles are in the foreground with the existing PG&E and MSCC transmission poles in the middleground. The poles would be galvanized steel and similar in color with the existing transmission lines. The poles would cause a low level of contrast in regard to form, line, color, texture and scale with the existing transmission and regional facilities in the foreground and middleground.

CONTRAST WITH VEGETATION

Vegetation visible in the view from KOP 6 towards the project site consist of irrigated field and row crops in the foreground and middleground. The vertical form of the poles would contrast highly with the irregular form of the existing vegetation. 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 green tones of the vegetation. The power poles 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 AND WATER

No water is visible in this view. The landform consists of flat natural land. The proposed transmission poles would contrast highly with this land surface in regard to form and line. The gray tone color of the power 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. However, the linear facilities would add incrementally to the contrast with land caused by the existing local power lines and transmission lines, 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 small in size compared to the panoramic field of view and would occupy a moderate part of the setting. Therefore, scale dominance from KOP 6 would be co-dominant.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 6 is panoramic, the proposed linear facilities would be subordinate in regard to composition. Because the visible portions of the project would be backdropped by the sky, spatial dominance would be prominent. The overall spatial dominance rating would be co-dominant, similar to the existing transmission lines.

VIEW BLOCKAGE

From KOP 6, with the panoramic view, the linear facilities would not block the view of the sky, so the proposed poles would only block a small portion of the field of vision. Therefore, view blockage would be weak.

VISUAL IMPACT

It can be concluded that the proposed linear facilities would not have a significant visual impact based on the following summary of visual factors for KOP 6:

- viewer sensitivity is high and low for local field laborers;
- visual quality is low to moderate;
- visibility is moderate;
- viewer exposure is moderate;

- the highest level of contrast would be low;
- scale dominance would be co-dominant;
- spatial dominance would be co-dominant; and
- view blockage would be weak.

VISIBLE PLUMES

COOLING TOWER 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.

WZI Inc., a consultant for the applicant, prepared an independent plume analysis in response to staff's data request. The consultant provided modeling results for the frequency, duration, and size of the plumes from the project's cooling tower. The consultant's conclusion of their modeling analysis indicated that " based on the 1994 meteorological data, the Seasonal/ Annual Cooling Tower Impact Program model predicted that the condensed plume length would be 1,640 feet, 6,561 feet, and 19,685 feet for 27 percent, 14 percent, and 1.75 percent of total hours when a plume would be visible, respectively. The plume height was predicted to exceed 164, 328, and 1,640 feet above the tower height 60 percent, 43 percent, and 19 percent of the total hours" respectively. According to the Seasonal/annual Cooling Tower Impact Program (SACTIP) model, which considered all hours, a plume will be visible more than 164 feet above the stacks 59 percent of the time (i.e., 5,200 hours). Most of the time these plumes would have a radius less than 98 feet. Plumes longer than 3,200 feet were predicted to occur approximately 2,400 hours per year. However, 950 of those events were predicted when winds were blowing to the northeast and north-northeast sectors. With high relative humidity, it is estimated that plumes longer than 3200 feet will be visible less than 1,600 hours per year. (MSCC 1999c, data response 3).

As indicated under their analysis, the plume of steam rising from the cooling towers could project upward as much as 1,640 feet from the top of the cooling tower under worst case conditions of temperature and atmospheric conditions.

WZI Inc. further indicated that relatively large condensed plumes occur during conditions of high relative humidity when ambient air is near saturation. When the relative humidity approaches 100 percent, the plume is effectively always condensed. Additionally, the stable atmospheric conditions and cool ambient temperatures that are conducive to plume stability generally occur during the night when a plume would not be visible, especially in the remote location of the proposed MSCC project facility.

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.

Energy Commission staff evaluated the independent plume analysis prepared by WZI Inc. and concluded that the analysis is complete and acceptable as an estimate of the potential visual impacts from the cooling tower steam plume.

VIEW-SHED

The view-shed 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 two stacks, proposed to be 130 feet tall. The maximum predicted height of the plume above the cooling towers is over 1,000 feet. The primary area of view-shed is along West Crocker Springs Road, which is not a heavily traveled public road, and no residences are in the area of the proposed plant site.

VISUAL QUALITY

The cooling tower plume's view-shed includes the Crocker Canyon and the surrounding Telephone Hills. Large portions of the natural landscape have been altered by oil production facilities, so visual quality is low to moderate.

VIEWER SENSITIVITY

Travelers on West Crocker Road 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 this roadway are considered to have low to moderate visual sensitivity because the area is not known for its scenic value, so few recreational travelers use this roadway.

VISIBILITY

West Crocker Road runs 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 number of travelers on West Crocker Road in this area is approximately 800 vehicles per day (MSCC 2000a). Therefore, the number of traveling viewers is low. 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 low for the traveling public. Maximum duration of view for travelers on West Crocker Road 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 a traveler is short. In summary, for the traveling public, the viewing distance is middleground, the number of viewers is low, and the duration of view is short, so overall visual exposure for travelers is low to moderate.

VISUAL IMPACT SUSCEPTIBILITY

For travelers on West Crocker Road, visual quality is low to moderate, visual sensitivity is low to moderate, visibility is low to moderate, and viewer exposure is low to moderate. Considering these factors, for travelers on West Crocker Road visual impact susceptibility is 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 rural setting mixed with oil production facilities in the area. An existing gas processing and cogeneration plant are adjacent to the proposed plant with various tanks and oil wells. The highest structures currently on site consist of the three, 53 -foot high HRSG exhaust stacks. 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 Telephone 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 moderate contrast in regard to the form of the land, which consists of flat valley views, with the Telephone Hills in the middleground and Temblor Mountains in the background. The plume of steam rising from the cooling towers will occur intermittently.

The plume would cause high contrast in regard to the generally straight line of the horizon and the irregular line of the Telephone 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 moderate contrast with the scale of the land, appearing somewhat 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 line, and color, and moderate contrast in regard to form, scale and 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 back-dropped by sky, spatial dominance in regard to backdrop would be between prominent and subordinate. Overall, spatial dominance would be co-dominant.

VIEW BLOCKAGE

For the traveling public in the viewshed of the plume, during the limited times over the year it would occur, the plume would block a low to moderate portion of the view of the Telephone Hills and Temblor Mountains. Therefore, the severity of view blockage would be low to 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 moderate in regard to form, line, and color, d) scale dominance would be co-dominant, and e) spatial dominance would be co- dominant, the cooling tower plume's visual impact severity would be moderate (See VISUAL RESOURCES Table B-1).

VISUAL IMPACT

For travelers on West Crocker Road, 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 strong, so visual impacts would be less than significant. This also takes into account the limited times per year that the plume would occur, the generally poor weather conditions expected when the plume would occur, and no affected residences in the area.

CUMULATIVE IMPACTS

The proposed power plant would add a noticeable but not considerable increment to the existing industrial character of this portion of the Telephone Hills. In regard to the potential for cumulative visual impacts from the proposed Midway Sunset Cogeneration Power Plant, the proposed La Paloma Power Plant, and the proposed Sunrise Cogeneration Project, almost 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. In addition, the viewshed is visually separate by approximately 7 to 8 miles. The transmission line proposed as part of the Midway project terminates at the Midway Substation near Buttonwillow, as does Transmission Line 1B for the Elk Hills Power Plant. Cumulative impacts at Midway Substation will be insignificant because the two-transmission lines approach the substation from different directions. The Buttonwillow area already has a high density of transmission lines and the incremental impact of the Western MSCC project will be difficult to distinguish from the other transmission lines. In conclusion, the proposed power plant would not contribute substantially to a significant cumulative visual impact.

FACILITY 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

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 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 has addressed this requirement under the proposed Conditions of Certification section (VIS-5) of this analysis and its implementation satisfy the requirements of the Kern County General Plan and Zoning Code. The Western MSCC 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.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

SPECIFIC MITIGATION MEASURES

The Applicant has proposed three mitigation measures to " lower the visibility of the power plant and the transmission lines" (MSCC 2000a, p.5.13-48):

- Project facilities will be painted with neutral earth tone and gray colors that will blend with existing facilities and the background of grass and shrub covered hills. The proposed color scheme for the power plant will be submitted to the Energy Commission prior to performing facility painting or other color treatments.
- 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 and illumination will be low as is reasonable.

- The transmission poles and the elements of the substation will have a galvanized finish.

EFFECTIVENESS OF THE APPLICANT'S PROPOSED MITIGATION MEASURES

The Applicant's proposed mitigation measures would 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 is 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 pre-colored 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 back-scatter 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)

The transmission poles will be sited so as to avoid locations in or near the front yards of residences located on Ellis Road, Reserve Road, and Buerkle Road. The transmission poles will have a naturally oxidized finish or galvanized finish.

STAFF MITIGATION 4 (CONDITION 5)

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.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

With application of the proposed mitigation, 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 visibility during any given time. In addition, because of the project's rural setting, and lack of residences in the area, staff has determined that periodic and seasonal condensation plumes will not have a significant impact.

RECOMMENDATION

If the project is approved the Energy Commission technical staff recommends adoption of the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Prior to the start of commercial operation, the project owner shall treat the project structures, buildings, towers, substation and tanks visible to the public in a non-reflective finish and color to blend with the natural surroundings. The project owner shall treat the cooling towers with a heat-resistant color that minimizes contrast and harmonizes with the surrounding environment.

- The project owner shall submit a treatment plan for the project structure and equipment to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:
- specification, and 11" x 17" color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture;
- a detailed schedule for completion of the treatment; and,
- a procedure to ensure proper treatment maintenance for the life of the project.
- if the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan.

Protocol: After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

Verification: Not later than 30 days prior to ordering the first structures that are 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, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within 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.

Not less than 30 days prior to the start of commercial operation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-2 Any fencing for the project shall be non-reflective.

Protocol: Prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

- If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.
- The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.
- The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.

Verification: At least 30 days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

VIS-3 Prior to the start of commercial operation, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements:

Protocol: The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

a) Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

b) 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; and

c) A lighting complaint resolution form (following the general format of that in attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting 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.

Verification: At least 90 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval. The CPM will notify the project owner of approval or disapproval within 15 days of receipt of the lighting plan. If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscaping that the landscaping is ready for inspection.

VIS-4 To minimize potential visual impacts, the project owner shall place all electrical transmission poles as to not be directly in front of any residences.

Protocol: Prior to construction of the transmission line, the project owner shall submit a plan to the CPM showing:

- All proposed pole locations;
- All residences within one-quarter mile of the proposed transmission route that have a view of the transmission line.

Installation of transmission line poles shall not begin before the plan is approved. The project owner shall notify the CPM when the poles have been installed and are ready for inspection.

Verification: At least 60 days prior to beginning transmission line construction, the project owner shall provide the electrical transmission pole plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

VIS-5 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.

a) The project owner shall submit to the CPM for review and approval a specific plan describing its landscaping proposal. The project owner shall provide the CPM a letter of comment from the Kern County Planning Director stating that the landscape plan is consistent with the provisions of the Kern County General Plan and Zoning Ordinance. The plan shall include, but not be limited to:

- detailed landscape plan, at a reasonable scale, which includes a list of proposed vegetative 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 vegetative plantings shall not be planted before the plan is approved. The project owner shall notify the CPM when the vegetative plantings 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.

REFERENCES

Andrews, Richard N.L., 1980, Landscape Values in Public Decisions. In Proceedings Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource, pp. 686-692, April 23-25, 1979, Incline Village, Nevada. General Technical Report PSW-35. U.S. Dept. of Interior, Forest Service, Pacific Southwest Forest and Range Experiment Station. Berkeley, CA. NTIS PB81-157620.

Blair, William G., 1980, Visual Resource Management, in Environmental Comment

Blair, William G., 1986, Visual Impact Assessment in Urban Environments. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. pp.223-244. John Wiley & Sons. New York.

Buhyoff, Gregory J. et al.

CEC, 1993a, Commission Decision Application for a Small Power Plant Exemption including: Revised Initial Study/Mitigated Negative Declaration Carson Energy Group and Central Valley Financing Authority's Application for a Combined Cycle Cogeneration Facility and Ice Manufacturing Plant, issued June 23, 1993.

Crystal, Joseph H., 1978, Measuring Scenic Quality at the Urban Fringe. Landscape Research 3(3), 9-11, 14.

Felleman, John P., 1986, Landscape Visibility. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. Pp.47-62. John Wiley & Sons. New York.

Grinde, Kate and Al Kopf, 1986, Illustrated Glossary. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. pp.307-333. John Wiley & Sons. New York.

ATTACHMENT 1
LIGHTING COMPLAINT RESOLUTION FORM

MIDWAY-SUNSET POWER 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 APPENDIX A
Visual Resources Figures 2,2a,6,6a,7,7a

VISUAL RESOURCES Figure 2
KOP 1 (Existing View of Proposed Power Plant)

VISUAL RESOURCES Figures 2a
KOP 1 (Simulation)

VISUAL RESOURCES Figure 6
KOP 5 (Existing View/Transmission Line-Buerkle Road)

VISUAL RESOURCES Figure 6a
KOP 5 (Simulation)

VISUAL RESOURCES Figure 7
KOP 6 (Existing View/Transmission Line- Mirasol Avenue)

VISUAL RESOURCES Figure 7a
KOP 6 (Simulation)

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 ?significant effect" on the environment to mean a ?substantial, 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, ? 15382.) Appendix G, subdivision (b), of the Guidelines state that a project ?will 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				
	Very Strong	**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

Andrews, Richard N.L. 1980. "Landscape Values in Public Decisions." In Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource, pp. 686-692, April 23-25, 1979, Incline Village, Nevada. General Technical Report PSW-35. U.S. Dept. of Interior, Forest Service, Pacific Southwest Forest and Range Experiment Station. Berkeley, CA. NTIS PB81-157620.

Blair, William G. 1980. "Visual Resource Management." In Environmental Comment.

Blair, William G. 1986. "Visual Impact Assessment in Urban Environments." In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. pp.223-244. John Wiley & Sons. New York.

Felleman, John P. 1986. "Landscape Visibility." In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. pp.47-62. John Wiley & Sons. New York.

Grinde, Kate and Al Kopf. 1986. "Illustrated Glossary." In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. pp.307-333. John Wiley & Sons. New York.

Smardon, Richard C., Tony Costello, and Harry Eggink. 1986. "Urban Visual Description and Analysis." In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. pp.21-35. John Wiley & Sons. New York

CULTURAL RESOURCES

Testimony of Gary Reinoehl and Dorothy Torres

INTRODUCTION

This analysis discusses cultural resources, which are defined as 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 resource materials may be found nearly anywhere in California: along the ocean coastline and on coastal islands; along rivers and streams; in coastal and inland valleys and lowlands; throughout the coastal and inland mountain ranges; and throughout the interior deserts. Cultural resources may be found on the ground or may be found at varying depths beneath the surface. In some areas of the state, a sequence of settlements on the same site may cover multiple layers of cultural resources. In other areas, the distribution of cultural materials may be much more dispersed and seemingly unrelated.

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.

Staff's primary concerns in its cultural resource analysis are to ensure that all potential impacts are identified and that conditions are set forth that ensure no significant adverse impacts will occur. The determination of potential impacts to cultural resources from the proposed Western Midway Sunset Cogeneration Company Project (Western MSCC) is required by the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Three aspects of cultural resources are addressed in staff's analysis: prehistoric archaeological resources, historic archaeological resources, and ethnographic resources.

PREHISTORIC RESOURCES

Prehistoric archaeological 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 Native American 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 archaeological 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, traveled ways, artifacts, documents, or other evidence of human activity. Under federal and state requirements, cultural resources must be greater than fifty years old to be considered of potential historical importance.

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 site, 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, Section 431 et seq.) 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 to ensure compliance with these laws.

FEDERAL

- National Environmental Policy Act (NEPA): Title 42, United States code, section 4321-et seq., 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, USC, section 1701 et seq., requires the Secretary of the 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 1701(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 Register 44739-44738, 190 (September 30, 1983): 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. The State Historic Preservation Office refers to these standards in its requirements for selection of qualified personnel and in

the mitigation of potential impacts to cultural resources on public lands in California.

- National Historic Preservation Act, 16 USC 470, commonly referred to as Section 106, requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. Regulations revised in 1997 (36 CFR Part 800 et. seq.) set 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 (NRHP). The eligibility criteria and the process are used by federal, state, and local agencies in the evaluation of 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. Recent revisions to Section 106 in 1999 emphasized the importance of Native American consultation.
- 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 the return of specified cultural items.

STATE

- 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.

  (q) "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 Historical Resources; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures.

- Public Resources Code, Section 5097.5 states that any unauthorized removal or destruction of archaeologic or paleontologic resources on sites located on public land 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.
- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials.
- Public Resources Code, Section 5097.99 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code, Section 5097.991 states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.
- Public Resources code, Section 21000, et seq, California Environmental Quality Act (CEQA) This act requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code, Section 21083.2 states that if a project may affect a resource that has not met the definition of an historical resource set forth in section 21084, then the lead agency may determine whether a project may have a significant effect on “unique” archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they can not be avoided mitigation measures shall be required. The law also discusses excavation as mitigation; discussed the costs of mitigation for several types of projects; sets time frames for excavation; defines “unique and non-unique archaeological resources; provides for mitigation of unexpected resources; and sets financial limitations for this section.
- Public Resources Code, Section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a “historic resource” and describes what constitutes a “significant” historic resource.
- CEQA guidelines, Title 14, California Code of Regulations, Section 15126.4 “Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects” sub-section (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource. Subsection (b) also discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.
- CEQA Guidelines, Title 14, California Code of Regulation, Section 15064.5 “Determining the Significance of Impacts to Archaeological and Historical Resources”. Subsection (a) defines the term “historical resources.” Subsection

(b) explains when a project may be deemed to have a significant effect on historical resources and defines terms used in describing those situations. Subsection (c) describes CEQAs' applicability to archaeological sites and provides a bridge between the application of the terms "historical" resources and a "unique" archaeological resource."

- CEQA Guidelines, Title 14 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."
- CEQA Guidelines, Appendix "G" Issue V: Cultural Resources. Lists four questions to be answered in determining the potential for a project to impact archaeological, historic, and paleontologic resources.
- California Penal Code, Section 622.5. Anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.
- 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 disposition of the remains and any associated burial items.
- Government Code, Section 6254.10. Nothing in this chapter requires disclosure of records that relate to archeological site information maintained by the Department of Parks and Recreation, the State Historical Resources Commission, or the State Lands Commission.

LOCAL

Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulation, standards, plans, and policies.

KERN COUNTY

Kern County staff have previously indicated that they do not have a specific county policy that addresses cultural resources, but they do ensure compliance with CEQA for most projects (Forrest 1999).

ENVIRONMENTAL SETTING

REGIONAL DESCRIPTION

The project area is located in the Great Valley Physiographic Province of California, which is 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 area proposed for the project is located along the southwestern margin of the San Joaquin Valley north of the Transverse Ranges and situated in the southeastern foothills of the Temblor Range (Midway 1999a, p.3.3-1). It is an area of high summer temperatures and little rainfall. The average rainfall in nearby Bakersfield is 5.7 inches (Midway 1999a, p. 5.5-1). Although the area now appears barren with little moisture, before water control projects, Lake Buena Vista, at times, covered as much as 760 square miles.

PROJECT VICINITY DESCRIPTION

Oil production and agriculture have previously disturbed the project vicinity. To the north, the McKittrick area is rich in both marine and non-marine fossils and is also noted for chert outcroppings which were exploited prehistorically as a lithic resource (Midway 1999a, p. 5.7-5). There are a few small springs and ephemeral water sources in the area, but no permanent streams. The area, which is now essentially a dessert, was at one time richly watered and included wetlands plant, animals and waterfowl.

Refer to the **PROJECT DESCRIPTION** section of this Final Staff Assessment (FSA) for additional information and maps of the project development region and the project area.

PREHISTORIC SETTING

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. Until the 1840's, the ancient Buena Vista Lakeshore was present a few miles from the project area. In the 1940's W.R. Wedel conducted archaeological excavations at a complex of midden and burial sites along the southwestern shore of Buena Vista Lake. In the 1960s's D. A. Fredrickson and co-workers discovered a more deeply buried component to the site (Moratto 1984, p. 99). Much of the archaeological investigation in this area focused on areas threatened by development (Midway 1999a, p.5.7-5 to 5.7-7).

ETHNOGRAPHIC BACKGROUND

Archaeological evidence indicates that the project area was inhabited primarily by the Southern Valley Yokuts. There is information however, that indicates the western margin of the project area may have been inhabited by the Cuyama branch of the Interior Chumash. There is additional evidence that indicates that these two groups may have jointly used the area and at the least, engaged in trade.

HISTORIC SETTING

Spanish missionaries began their exploration and development of the missions in California in 1769 starting in San Diego and ending with the missions in San Rafael and Sonoma, in 1823. Miller and Lux established headquarters at Buttonwillow for their massive ranching empire during the last half of the 19th century. The Midway area boomed only after oil seepage was identified and the name Midway was used

to identify a location midway between Asphalto (now McKittrick) and Sunset. (Midway 1999a, p. 5.7-13)

RESOURCES INVENTORY

LITERATURE AND RECORDS SEARCH

Prior to preparation of the AFC, consultants to the applicant conducted a literature search and reviewed site records and maps at the Southern San Joaquin Valley Archaeological Information Center (CHRIS). The consultant to the applicant also researched information in a variety of published and unpublished documents and a directory of Yokut place names. (Midway 1999a, pp. 5.7-12 to 5.7-13). The Area of Potential Effect (APE) for the plant site is identified as "100 feet outside the planned disturbance area." (Midway 2000c, p.S1-5.7-1). The APE for the transmission line was established as being 50 feet on either side of the proposed centerline. The applicant asserted that five previous studies occurred within the last five years and were all still applicable to the project. In addition, they posited that these five studies included all portions of the current project area that might have potential to result in adverse impacts to archaeological sites. Information assessed by the consultant to the applicant drew heavily on the Jackson Shapiro survey, originally completed for the Sunrise project.

Prior to the survey conducted in May 1999, Jackson and Shapiro had also contacted the Southern San Joaquin Valley Information Center of the CHRIS for cultural resources information within one mile of the study area (Pacific 1999 p. 13). Based on the literature and records search a total of 29 cultural resource locations were identified within the project APE (Midway 1999a, p. 4).

On July 10, 2000, staff received additional information regarding site PL-6. Consultant to the applicant, David S. Whitley, Ph.D. reviewed site records for this historic site and briefly visited the site. It is Dr. Whitley's opinion that the site does not meet eligibility requirements for the NRHP (Midway 2000aa, p.3).

FIELD SURVEYS

The applicant provided information indicating that the Jackson and Shapiro survey (1999) covered the Western MSCC proposed plant site and transmission route, but not the proposed water supply pipeline route (Midway 2000s, letter dated 2/7/2000). The archaeological field survey for this area was completed for the Sunrise Cogeneration and Power Project by Thomas L. Jackson Ph.D. and William A. Shapiro, M.A. In areas where cultural resources were anticipated and in areas where there was good ground visibility, ten meter wide transects were used (Pacific 1999 p.30). In heavily disturbed areas, transects up to 25 meters were surveyed. Unsurfaced roads proposed for construction access were surveyed along the length of the roadways and by extending 15 meters beyond the shoulders of the road.

The archaeological methods employed to survey the area were oriented toward identification of both prehistoric and historic resources. Except for specific areas along the transmission line route and Crocker Canyon, the Jackson and Shapiro

report stated that the archaeological sensitivity of the surveyed area was low (Pacific 1999a, p30).

POWER PLANT SITE

The proposed Western MSCC site is located in the southern margin of the San Joaquin Valley. It is an area that has experienced oilfield development in the south of the project site and agriculture in the northeast. Much of the area has been disturbed by previous oil production activity and road building (Midway, 1999a p.5). 5.7-15). Two isolates were previously identified within the project site area. The presence of these two isolates may signal a potentially buried archaeological site (Midway.1999a, p.6).

PROPOSED NATURAL GAS LINE

Two existing gas lines serve the existing Midway Sunset Cogeneration Company (MSCC) and are sufficient in size to also serve the proposed Western MSCC project (Midway 1999a p. 1-4).

WATER PIPELINE

The raw water line 16 inches in diameter and 1.8 miles long would be constructed along a previously established right-of-way on existing pipe supports. Page S1-5.7-2 of supplemental information submitted in February 2000 indicates that the water pipeline is on existing structures and that there are no previously recorded sites within the vicinity of this pipeline (Midway 1999d, p. S1-5.7-2).

The waterline route was surveyed on July 7, 2000. The survey team walked transects on both sides of the existing pipeline support system. The survey covered an area approximately 30 feet in width. Groundsurface visibility was excellent and along this route the groundsurface had been entirely disturbed. A Native American consultant/monitor was present during this survey (Midway 2000b, p.4).

ELECTRIC TRANSMISSION LINE

Most of the approximately 19-mile transmission line route was surveyed as part of the Jackson Shapiro survey for Sunrise Project. However, some areas near the Midway Substation were not surveyed because they were in agricultural production at the time of the survey (Pacific 1999, p. 19). The survey utilized a 1,000 to 2,000 foot wide corridor along the transmission line route. Where sites had been previously identified as present, but outside the survey corridor, field crews investigated to ensure that no portion of the sites extended into the survey corridor. Field crews also documented sites that extended from the survey corridor into surrounding terrain, in their entirety (Pacific 1999 p. 4).
Figure 4e, a Survey Coverage Map provided in the Jackson and Shapiro report, indicated that some areas along the transmission line route had not been surveyed. On July 7, 2000, W&S consultants conducted a survey that covered mileposts 15.5 to 16.0, 17.5 to 18.0 and 18.4 to 19. The survey covered an area that totaled approximately 3.6 miles in length. Three crewmembers walked parallel transects at approximately 10 to 15 meter intervals. The survey extended to approximately 100 feet on each side of the transmission line right of way. Visibility varied, but was

adequate over the entire area to determine the presence of cultural resources. One previously recorded, but not evaluated, site was identified. A Native American consultant/monitor was present during this survey (Midway 2000bb, pp.1-6)

NATIVE AMERICAN CONTACTS

The consultant to the applicant contacted the Native American Heritage Commission (NAHC) to obtain a list of concerned Native Americans living in Kern County. The applicant sent letters on February 8, 2000, describing the project and asking about their concerns. There was no response to the inquiries.

IMPACTS

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed Western MSCC project has the potential to adversely affect both known and previously unknown cultural resources. 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 vandalism to exposed resource materials due to improved accessibility. Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Although the existence of known cultural resources increases the potential for additional resources, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur. In addition, the potential for discovery does not measure the significance of individual artifacts or other cultural resources present, since it is impossible to accurately predict what specific materials may be encountered. Furthermore, sometimes the full significance of discovered cultural resources can only be determined after they have been collected, prepared, and studied by professional archaeologists.

POTENTIAL FOR PROJECT IMPACTS

Because project-related site development and construction would entail sub-surface disturbance of the ground, the proposed project has the potential to adversely affect previously unknown cultural resources. Twenty-nine archaeological sites, features, or objects are known to be located within one mile of the proposed project. These sites include historic-era buildings. The presence of numerous sites in some locations along the transmission line route indicates a high potential for previously unknown historic and prehistoric resources to be encountered and affected during project construction in areas within the APE.

POWER PLANT SITE AND LAYDOWN AREA

Approximately 10 acres for project facilities and an additional 6 acres for a laydown area, totaling 16 acres, are likely to be disturbed by the project (Midway 1999a, p. 5.7-1). The six-acre laydown area was previously used as a laydown area for the MSCC Project. Excavations for project site foundations would be typically less than five feet. Existing plant site terrain slopes from a high point of 1,865 feet above sea level (ASL) to a low pint of 1,815 feet ASL. The location will be cut and filled to a level of approximately 1,834 feet ASL (Midway 1999a p. 3.5-6 to 3.5-7).

As described in the AFC, there are no previously recorded cultural resources sites present within the project site or laydown area. Surveys for the Sunrise project expressed concern that Crocker Canyon was an area containing sensitive archaeological resources and identified two archaeological isolates adjacent to the proposed plant site.

ELECTRICAL TRANSMISSION LINE

The electric transmission line would be approximately 19 miles long and would connect with the existing Midway Substation. Portions of this line would cross an area that was previously part of the ancient Buena Vista Slough system. There are twenty-seven previously identified sites and isolates along the proposed transmission line route. The confidential cultural resources supplement to the AFC identifies three of these sites CA-KER-2720, CA-KER-2721, PL6 as possessing value that would make them eligible for listing on the NRHP or CRHR. Additional sites that have been damaged, but may retain integrity and significant archaeological materials identified along this route are CA-KER-34/35/36, CA-KER-4013, CA-KER-4014 and PL-3, 4 and 5. There is a potential for the instillation of power poles to impact these resources (Midway 1999a, p.5). Outside the APE, but close enough to the proposed transmission line to concern staff, between approximately Mile-Post 14 to Mile-Post 19 there are several locations where burials were previously discovered.

On July 7, 2000 the applicant conducted a survey of areas not surveyed during the Jackson/Shapiro survey. The presence of previously recorded site CA-KER-4013 was reconfirmed. This site has not been evaluated for significance. Impacts to this site should be mitigated by avoidance. Monitoring is recommended between mileposts 13 to 19 (Midway 2000bb, p. 6).

Ground disturbance and construction would occur in the vicinity of site PL-6. Since opinions differ between archaeologists concerning whether or not portions of this site might be eligible for listing on the NRHP and it is not likely that the potentially eligible buildings will be impacted, staff will recommend monitoring to ensure that there are no impacts.

NATURAL GAS PIPELINE

Existing natural gas lines would be used for this project (Midway 1999a, p. 1-4).

WATER LINES

A water line already in service to the existing MSCC facility will be used to deliver potable water to the proposed Western MSCC site.

The new raw water line will be a 16-inch diameter pipeline approximately 1.8 miles long. Construction of the water line is an issue that staff clarified in workshops. The AFC p. 1-9 states that a line will be constructed to deliver the water. The line will be added to an existing above ground pipe rack. Construction of additional supports to the rack might be necessary.

In 1992 Louis James Tartaglia, Ph.D. and Leslie c. Grover M.A. surveyed different portions of this site for separate projects. Tartaglia's survey covered only BLM land within the impact area of his assigned project. Grover did not identify any cultural resources either in the records search or field survey. Tataglia did not identify any cultural resources within his projects APE either by records search or field survey. However, Taraglia cautioned that twenty two sites, primarily associated with oil field development, had been recorded within a two-mile radius of his study area indicating that this area is a sensitive archaeological zone (Midway 2000w, p. 21).

The survey of the water line conducted on July 7, 2000 confirmed that the area is very disturbed due to a long history of oil production. No archaeological remains were found to be present in this area (Midway 2000bb, pp. 4-5).

CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize resources by determining whether they meet several sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the resources and the mitigation that may be required to ameliorate any such impacts.

Under federal law, only historical or prehistoric sites, objects, or features, or architectural resources that are assessed by a qualified researcher as "important" or "significant" in accordance with federal guidelines need to be considered regarding potential impacts. The significance of historical and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the National Register of Historic Places as defined in 36 CFR 60.4. If such resources are determined to be significant, and therefore eligible for listing in the National Register, as well as the California Register, they are afforded certain protection under the National Historic Preservation Act and/or CEQA.

The National Register criteria state that "eligible historic properties" are: districts, sites, building, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (a) are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or (d) that have yielded, or may be likely to yield, information

important to history or prehistory. Isolated finds by definition do not meet these criteria. California has adopted a very similar set of criteria for assessing resources of statewide importance.

Under federal law, resources determined not to be significant, that is, not eligible for National Register listing, are subject to recording and documentation only, and are afforded no further protection. However, occasionally certain resources, though not assessed as "significant," may nonetheless be of local or regional importance and mitigation may be warranted. Staff evaluates the survey reports and site records for any known resources located within or adjacent to the project APE to determine whether they meet the eligibility criteria.

The record and literature search and the walking surveys of the proposed project APE were conducted to identify the presence of any cultural resource sites or materials. Where resources were identified, additional evaluation will conducted to determine whether the resources are already listed on, or are potentially eligible for listing on, either the National Register of Historic Places (National Register) [36 CFR 800] or the California Register of Historic Resources. The determination of eligibility is made in compliance with the applicable provisions of the National Historic Preservation Act.

Beginning in 1999, the California State Resources Agency adopted considerable revisions to the regulations implementing CEQA. These changes affected the language applicable to staff's analysis of cultural resources. Previously, the bulk of the information on how to assess resource and impact significance and on the types of mitigation measures available was contained in Appendix K of the CEQA Guidelines. Much of the language of that appendix has now been incorporated into Title 14, California Code of Regulations, Section 15126.4 and 15064.5.

The CEQA Guidelines now explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect "historical resources." The guidelines provide a definition for historic resources and set forth a listing of criteria for making this determination. As used in CEQA, the term "historical resources" includes any resource, regardless of age, as long as it meets these criteria. If the criteria are met, the Energy Commission must evaluate whether the project will cause a "substantial adverse change in the significance of the historical resource," which the regulation defines as a significant effect on the environment. The recent CEQA changes also indicate that the mitigation for impacts to historical resources that meet these criteria shall not be subject to the limitations provided in PRC Section 21083.2.

Using the above criteria, staff has determined that the cultural resource sites described in the AFC and in subsequent filings for the Western MSCC project meet one or more of the criteria for being an historical resource. As such, staff recommends full mitigation during project construction and operation activities, in order to protect these resources.

CEQA also contains a section addressing "unique" archeological resources and provides a definition of such resources (Public Resources Code, Section 21083.2).

This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the prohibition in this section does not apply when an archeological resource has already met the definition of a historical resource (Title 14, California Code of Regulations, Section 15064.5). Since staff has determined that the sites for which it is recommending mitigation meet the definition of historical resources, the prohibition does not apply to the mitigation discussed in this staff assessment.

CUMULATIVE IMPACTS

Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project. The Energy Commission has certified one power generation project (La Paloma, Oct. 1999), and is currently reviewing, or anticipates receiving for review, at least four large power generation projects, all proposed for construction in southern Kern County.

Proposed developments such as these large power generation projects and associated linear facilities, and ongoing oil field and agricultural production, are extending farther into the southern San Joaquin Valley. The combined effects of this development can accelerate the potential for continued disturbance of cultural resource sites, the loss of significant information, and alteration of an historical landscape. The level of cumulative impact would grow as increasing development opens more undisturbed areas and eventually exposes highly sensitive cultural resource sites.

The La Paloma project, the existing MSCC power plant, the Sunrise project, and the proposed Western MSCC project would all use approximately the same transmission corridor. Mitigation measures are required of each project to avoid cultural resources identified in the vicinity of this corridor.

At this time, the process of defining site boundaries and determining site significance is still underway, and the full inventory of significant cultural resources may only be completed during the construction phase. The applicant can mitigate impacts to both undetermined and identified sites to less than significant by following staff's recommendations for monitoring and mitigation set forth in the conditions of certification.

IMPACTS OF FACILITY CLOSURE

The anticipated lifetime of the Western MSCC project is expected to be approximately thirty 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 would occur when the plant becomes economically non-competitive.

PLANNED CLOSURE

At the time of planned 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 is expected. However, actual potential impacts are likely to depend upon the final location of project structures in relation to existing resources, and 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.

TEMPORARY CLOSURE

A contingency plan for temporary cessation of operation will implemented that will ensure compliance with all applicable LORS.

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.

COMPLIANCE WITH APPLICABLE LORS

Prior to initiating activity on Bureau of Land Management (BLM) land along the raw water line route, the applicant will apply for the appropriate BLM permit. The BLM typically does not review project information until there is an application before them for a permit. At present they do not anticipate concerns in addition to those addressed by this document. Kern County has no specific LORS apart from compliance with CEQA.

MITIGATION

For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often, however, avoidance cannot be achieved, and other measures such as surface collection, subsurface testing, and data recovery must be implemented. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

APPLICANT'S PROPOSED MITIGATION

As recommended by the consultant to the applicant in the confidential supplement to the AFC, the best mitigation measure is site avoidance and preservation. Avoidance can be accomplished in the area of the transmission line right of way by spanning previously identified sites and potentially sensitive areas (Midway 1999a, p. 6). Other methods of avoidance suggested in the AFC include demarcation of boundaries of known cultural resources, and fencing, and directing construction

equipment away from environmentally sensitive areas (Midway 1999a, p. 5.7-19). Construction crews will be informed concerning the importance of cultural resources and the legal protections afforded them.

Because a portion of the transmission line is particularly sensitive for cultural resources, mitigation measures originally suggested by archaeologists Tom Jackson and William Shapiro for the Sunrise project are also recommended for the Western MSCC project by consultant to the applicant archaeologist David Whitely. It is recommended that transmission pole placement be designed to span all known sites. Where it is not possible to span a site or where there are archaeological remains an intensive archaeological examination of specific pole locations shall be undertaken. The examination must cover a 100 diamenter feet radius around the center of the pole site. If archaeological surface remains are found to be present, a 1X1 meter hand dug test pit must be used to determine whether there is an intact subsurface deposit. Lastly, Whitley recommends that all transmission line pole excavations between milepost (MP) 13 through 19 be monitored by an archaeologist.

During operation and maintenance phases of the project, to the greatest extent possible, project activities will be confined to existing roads or inspections will be performed by air or on foot, if possible (Midway 1999a, p5.7-21).

The applicant recommends the following:

- Avoidance
- Physical Demarcation and Protection
- Crew Education
- Archaeological Monitoring
- Formal Compliance with CEQA Appendix K/Section 106. (Author's note, CEQA guidelines were substantially amended effective on January 1, 1999. There is no longer an Appendix K) (Midway 1999a, p. 5.7-19 to 5.7-21).

Problems may occur if unanticipated cultural resources are discovered during construction. The applicant recommends avoidance, if the resource can not be avoided, the project archaeologist would consult with the CEC, the State Historic Preservation Officer or the BLM, if appropriate.

The applicant acknowledges emergency maintenance and repair or routine inspection (if the T-line is driven) could impact cultural resources. Mitigation for sites that could not be avoided during construction would include consideration of potential ongoing impacts to cultural resources. Crews engaging in maintenance and operation will to the greatest extent possible confine their activities to existing roads or inspect by air or on foot. The consultant to the applicant also recommends archaeological monitoring during subsurface grading in the vicinity of the Western MSCC project site(Midway, 1999a, p. 6).

STAFF'S PROPOSED MITIGATION MEASURES

Energy Commission staff concurs with the mitigation measures proposed by the applicant in the AFC and in the confidential supplement. Staff has adapted the applicant's proposed mitigation measures into a series of Conditions of Certification, sometimes rewording for clarification and adding time frames and other requirements. Adoption of staff's proposed Conditions of Certification is expected to reduce the potential for adverse project impacts on 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 U.S. Secretary of the Interior's guidelines. The mitigation measures set forth in the conditions have been applied to previous projects before the Energy 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.

Staff agrees with the applicant's suggestions for mitigation in the cultural resource sensitive areas of the transmission line. Staff proposes in addition to the 1x1 meter test pits recommended by the applicant, that if resources are discovered in the course of that testing every effort be made to relocate the transmission pole site. If moving the pole location can not become an option, site significance to include additional mitigation measures shall be determined in by the Designated Cultural Resource Specialist (DCRS) and the Compliance Project Manager (CPM).

Staff also agrees that archaeological monitoring should be conducted during ground disturbance in the sensitive areas of the transmission line route between mileposts 13 through 19 and at the project site. Staff also recommends the presence of a Native American monitor between milepost 13 through 19. The Jackson & Shapiro study indicated, in Figures 9 and 10, the presence of several Indian burial mounds in the vicinity of the area between milepost 13 and 19 (Pacific 1999 Fig. 9 & 10)

Staff also recommends archaeological monitoring in the area of site PL-6 to ensure that resources which appear to be eligible to the NRHP would be protected.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

There are a total of 29 recorded and recently identified cultural resource sites and isolates within one mile of the proposed Western MSCC project. Three of these sites have been determined eligible to the NRHP and by inference to the CRHR. An additional six sites are likely to be eligible. The presence of these previously identified cultural resources indicates that there is a strong possibility that project construction could encounter potentially significant cultural resources. If the following conditions of certification are properly implemented, the project would

comply with applicable laws, ordinances, regulations, and standards, and no significant adverse direct, indirect, or cumulative impacts to cultural resources would occur.

RECOMMENDATION

Staff recommends that the Energy Commission adopt the following proposed Conditions of Certification, which incorporate the mitigation measures discussed above.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of project-related ground disturbance (which is defined for this condition and all cultural conditions that follow as any vegetation clearance, project site preparation, grading, trenching, filling; excavation or augering), the project owner shall provide the California Energy Commission (Energy Commission) Compliance Project Manager (CPM) with the name and statement of qualifications of its DCRS, who would be responsible for implementation of all cultural resources Conditions of Certification.

Protocol: The statement of qualifications for the DCRS shall include all information needed to demonstrate that the specialist meets the minimum qualifications set forth below, including the following:

a) a graduate degree in anthropology, archaeology, California history, cultural resource management, or a comparable field;

b) at least three years of archaeological resource mitigation and field experience in California; and

c) at least one year's experience in each of the following areas:

1. leading archaeological resource field surveys;
2. leading site and artifact mapping, recording, and recovery operations;
3. marshalling and use of equipment necessary for cultural resource recovery and testing;
4. preparing recovered materials for analysis and identification;
5. determining the need for appropriate sampling and/or testing in the field and in the lab;
6. directing the analyses of mapped and recovered artifacts;
7. completing the identification and inventory of recovered cultural resource materials; and
8. preparing appropriate reports to be filed with the receiving curation repository, the State Historic Preservation Officer (SHPO), and the appropriate regional archaeological information center(s).

The statement of qualifications for the DCRS shall include:

a) a list of specific projects the specialist has previously worked on;

b) the role and responsibilities of the specialist for each project listed; and

c) The names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

Verification: At least 90 days prior to the start of project-related ground disturbance, the project owner shall submit the name and statement of qualifications of its DCRS to the CPM for review and written approval.

At least ten days, but no more than 30 days, prior to the start of any project-related ground disturbance, the project owner shall confirm in writing to the CPM that the approved DCRS will be available at the start date and is prepared to implement the cultural resource Conditions of Certification.

At least ten days prior to the termination or release of a DCRS, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and a statement of qualifications of the proposed new DCRS.

CUL-2 Prior to the start of project-related ground disturbance, the project owner shall provide the DCRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps provided will include the USGS 7.5 minute topographic quadrangle map and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the DCRS enlargements or strip maps for linear facility routes, the project owner shall provide them. In addition, the project owner shall provide a set of these maps to the CPM at the same time that they are provided to the specialist. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the DCRS and the CPM within five days. Maps shall show the location of all areas where surface disturbance may be associated with project related access roads, and any other project components.

Verification: At least 75 days prior to the start of project-related ground disturbance on the project, the project owner shall provide the DCRS and the CPM with the maps and drawings. Copies of maps or drawings reflecting changes to the footprint of the power plant and/or linear facilities shall be submitted to the cultural resources specialist and the CPM within five days of the changes.

CUL-3 Prior to the start of project-related ground disturbance, the DCRS shall prepare, and the project owner shall submit to the CPM for review and written approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to sensitive cultural resources. Approval of the CRMMP, by the CPM, shall occur prior to any project-related ground disturbance.

Protocol: The CRMMP 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. Specification 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. Identification of the person(s) expected to perform each of the tasks; a description of each team member's qualifications and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.

d. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.

e. A discussion of any 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 the measures will be needed to protect the resources from project-related effects.

f. A discussion of the location(s) where monitoring of project construction activities is deemed necessary by the DCRS. The specialist will determine the size or extent of the areas where monitoring is to occur and will establish the percentage of the time that the monitor(s) will be present, however monitoring shall be conducted full time in the specified areas that follow. Monitoring shall be conducted during ground disturbance on the transmission line route between mileposts 13 to 19, in the vicinity of site PL-6 and at the proposed project site. A Native American monitor shall be present during ground disturbance or archaeological testing between mileposts 13 to 19. If there is evidence that suggests subsurface cultural resources may be present at pole site locations, 1x1 meter test pits shall be used to determine the presence of resources. If resources are determined to be present, the DCRS or alternate shall contact the CPM. A determination of significance shall be made by the CPM in conjunction with the DCRS or alternate).

g. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and that all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and

requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.

h. 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.

i. 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 curation of the materials to be delivered for curation and how they will be met. Also the name and phone number of the contact person at the institution shall be included.

Verification: At least 60 days prior to the start of project-related ground disturbance, the project owner shall provide the CRMMP, prepared by the DCRS, to the CPM for review and approval.

CUL-4 Prior to the start of project-related ground disturbance, the DCRS shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and approval.

Protocol: The training program shall 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 shall be presented by the DCRS or qualified member of the cultural resources team(s) approved by the CPM and may be combined with other training programs prepared for biological resources, paleontologic resources, hazardous materials, or any other areas of interest or concern.

Verification: At least 60 days prior to the start of project-related ground disturbance; the project owner shall submit to the CPM for review and written approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during construction. The project owner shall provide the name and resume of the individual(s) performing the training.

CUL-5 Prior to the start of project-related ground disturbance, and throughout the project construction period as needed for all new employees, the project owner shall ensure that the designated cultural resource trainer(s) provide(s) the CPM-approved cultural resources training to all project managers, construction supervisors, and workers. The project owner shall ensure that the designated trainer provides the workers with the CPM-approved set of

procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction.

Training at the project site may be discontinued after all foundations at the site are completed and the DCRS has inspected the site and determined that no cultural resources will be impacted. Training shall continue for project personnel working in the vicinity of all project linears.

Verification: Within seven days after the start of project-related ground disturbance, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided to all project managers, construction supervisors, and workers hired before the start of construction the CPM-approved cultural resource training and the set of reporting and work curtailment procedures.

In each Monthly Compliance Report, after the start of construction, the project owner shall provide the CPM with documentation that the designated cultural resource trainer(s) has/have provided to all project managers, construction supervisors, and workers hired in the month to which the report applies, the CPM-approved cultural resources training and the set of resource reporting and work curtailment procedures.

After installation of all foundations at the project site, the project owner shall provide a letter to the CPM indicating that the DCRS has inspected the project site and has not observed any cultural resources that may be impacted by the project.

CUL-6 The DCRS or the specialist's monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered or may be impacted in a previously unanticipated manner during ground disturbance.

If such resources are found, the halting or redirection of construction shall remain in effect until:

a. The specialist has notified the CPM and the project owner of the find and the work stoppage;
b. The specialist, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
c. Any necessary data recovery and mitigation has been completed.

The specialist, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, determination of significance, data recovery or other mitigation is needed. If data recovery or other mitigation measures are required, the specialist and team members shall monitor construction activities and implement data recovery and mitigation measures, as needed.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: No more than 30 days or less than ten days prior to the start of project-related ground disturbance, the project owner shall provide the CPM with a letter confirming that the DCRS and monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find.

For any cultural resource encountered, the project owner shall notify the CPM within 24 hours after the find.

CUL-7 Prior to the start of project-related ground disturbance, and each week throughout project construction, the project owner shall provide the DCRS with a current schedule of anticipated project activity in the following month and a map indicating the area(s) where the construction activities will occur. The DCRS 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: Ten days prior to the start of project-related ground disturbance, and in each Monthly Compliance Report thereafter, the project owner shall provide the CPM with a copy of each weekly schedule of the construction activities. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

CUL-8 Throughout the pre-construction reconnaissance surveys and the construction monitoring and mitigation phases of the project, the DCRS and monitor(s) 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 daily logs shall indicate by tenths of a post mile, where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found.

The DCRS shall prepare a weekly summary of the daily logs on the progress or status of cultural resource-related activities.

The DCRS and monitor(s) may informally discuss the cultural resource monitoring and mitigation activities with Energy Commission technical staff.

Verification: Throughout the project construction period, the project owner shall ensure that the daily log(s) and the weekly summary reports prepared by the DCRS and monitor(s) are available for periodic audit by the CPM.

CUL-9 The DCRS or monitor(s) shall be present at times the specialist deems appropriate to monitor project-related ground disturbance, in the vicinity of previously recorded archaeological sites and in areas where cultural resources have been identified.

Cultural resource monitoring shall be conducted full time in the specified areas that follow: Cultural resource monitoring shall be conducted during ground disturbance on the transmission line route between mileposts 13 to 19, in the vicinity of site PL-6 and at the proposed project site. A Native American monitor shall be present during ground disturbing activities or archaeological testing between mile posts 13 to 19. If there is evidence that suggests subsurface cultural resources may be present at the pole site locations, 1x1 meter test pits shall be used to determine the presence of resources. If resources are determined to be present, the DCRS or alternate shall contact the CPM. (A determination of significance shall be made by the CPM in conjunction with the DCRS or alternate).

Protocol: Except in the areas specified in this condition, if the DCRS 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 and the CPM of the changes. The DCRS shall use milepost markers and boundary stakes placed by the project owner to identify areas where monitoring is being reduced or is no longer deemed necessary.

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 regarding project-related cultural resource monitoring.

CUL-10 The project owner shall ensure that the DCRS obtains and maintains a current BLM Archaeological Resource Use Permit to gain access to lands managed by the US BLM or other federal agencies, to conduct any surveys, monitoring, data and/or artifact recovery activities on these lands. This use permit is to be obtained from the area office of the BLM in Bakersfield, California, no less that ten days prior to the start of cultural resource activities governed by the permit.

Verification: The project owner shall provide the CPM and the designated BLM representative(s) with a copy of the BLM archaeological resource use permit received by the DCRS, in the next Monthly Compliance Report following its receipt or renewal.

CUL-11 The project owner shall ensure that the DCRS performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery 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. The project owner shall maintain these files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as to the specific location of sensitive cultural resource site shall be kept confidential and accessible only to qualified CRS's.

CUL-12 Following completion of data recovery and site mitigation work, the project owner shall ensure that the DCRS prepares a proposed scope of work for the Cultural Resources Report (CRR). The project owner shall submit the proposed scope of work to the CPM for review and approval.

Protocol: The proposed scope of work shall include (but not be limited to):

a. discussion of any analysis to be conducted on recovered cultural resource materials;
b. discussion of possible results and findings;
c. proposed research questions which may be answered or raised by analysis of the data recovered from the project; and
d. an estimate of the time needed to complete the analysis of recovered cultural resource materials and to prepare the CRR.

Verification: The project owner shall ensure that the DCRS prepares the proposed scope of work within 90 days following completion of the data recovery and site mitigation work. Within seven days after completion of the proposed scope of work, the project owner shall submit it to the CPM for review and written approval.

CUL-13 The project owner shall ensure that the DCRS prepares a CRR. The project owner shall submit the report to the CPM for review and written approval.

Protocol: The CRR shall include (but not be limited to) the following:

a. For all projects:

    1. description of pre-project literature search, surveys, and any testing activities;
    2. maps showing areas surveyed or tested;
    3. description of any monitoring activities;
    4. maps, including maps using a 7.5 minute USGS topographic base, of any areas monitored; and
    5. conclusions and recommendations.

b. For projects in which cultural resources were encountered, include the items specified under “a” and also provide:

    1. site and isolate records and maps;

2. description of testing for, and determinations of, significance and potential eligibility; and

3. a discussion of the research questions answered or raised by the data from the project.

c. For projects regarding which cultural resources were recovered, include the items specified under “a” and “b” and also provide:

1. a description of the methods employed in the field and laboratory; a description (including drawings and/or photos) of recovered cultural materials;

2. results and findings of any special analyses conducted on recovered cultural resource materials;

3. an inventory list of recovered cultural resource materials; an interpretation of the site(s) with regard to the research design; and

4. the name and location of the public repository receiving the recovered cultural resources for curation.

Verification: The project owner shall ensure that the DCRS completes the CRR within 90 days following completion of the analysis of the recovered cultural materials. Within seven days after completion of the report, the project owner shall submit the CRR to the CPM for review and approval.

CUL-14 The project owner shall submit an original, an original-quality copy, and a computer disc copy (or other format to meet the repository’s requirements), of the CPM-approved CRR to the public repository to receive the recovered data and materials for curation, with copies to the State Historic Preservation Officer (SHPO), the appropriate regional archaeological information center(s). If the report is submitted to any of these entities on a computer disc, the disc files must meet SHPO requirements for format and content.

Protocol: The copies of the CRR to be sent to the entities specified above shall include the following (based on the applicable scenario [a, b, or c] set forth in condition Cul-13):

a. originals or original-quality copies of all text;

b. originals of any topographic maps showing site and resource locations;

c. originals or original-quality copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys or during project monitoring and mitigtion and subjected to post-recovery analysis and evaluation.

d. photographs of any cultural resource 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 curation repository with a set of negatives for all of the photographs.

Verification: Within 30 days after receiving approval of the CRR, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO and the appropriate archaeological information center(s).

For the life of the project the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved CRR with the public repository receiving the recovered data and materials for curation.

CUL-15 Following the filing of the CPM-approved CRR with the appropriate entities, specified in condition CUL-14, the project owner shall ensure that all cultural resource materials, maps, and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within 30 days after providing the CPM-approved CRR to the entities specified in CUL-14.

For the life of the project the project owner shall maintain in its compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

CUL-16 Prior to the start of project-related ground disturbance, or presence/absence testing required in these conditions, the project owner and the DCRS shall consult with Native American tribal representatives to develop an agreement(s) for qualified (specified in the NAHC Guidelines for Monitoring) monitor(s). The monitor(s) shall be considered member(s) of the cultural resource team and shall be present during the pre-construction and construction phases of the project between mileposts 13 to 19 wherever ground disturbance and cultural resources monitoring activities are conducted.

Verification: At least 30 days prior to the start of project-related ground disturbance, the project owner shall provide the CPM with a copy of all finalized agreements for Native American monitors. If efforts to obtain the services of qualified Native American monitors prove unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

CUL-17 Prior to initial project site mobilization (i.e., placing a trailer on the site with accompanying equipment, utilities and grading) the project owner must comply with Cul-1 and Cul-4 and complete Cul-5 as it pertains to

management, supervisors and workers involved in this undertaking. The project owner shall comply with Cul-2 and Cul-3 for the entire project, but this need not be accomplished before the trailer is placed. If cultural resources are discovered, all cultural conditions shall apply.
Prior to the initial site mobilization, the DCRS shall examine the area of initial project site mobilization and ensure that there are no cultural resources that may require protection or mitigation.

Verification: At least seven days prior to engaging in the initial project site mobilization defined in this condition, the project owner shall provide the CPM with information authored by the DCRS identifying the area of initial site mobilization. The CRS shall indicate the method(s), procedure(s) and date(s) the cultural resource inspection was performed and an explanation of the anticipated project activities. The document will be reviewed and approved by the CPM.

REFERENCES

CEC (California Energy Commission/Smith) 1999b. Cultural and Paleontological Resources Maps. Submitted to Midway Sunset on December 30, 1999. California Energy Commission Docket Unit received on December 30, 1999.

Forrest, Suzanne. 1999. Report of Conversation (ROC) between Suzanne Forrest, Associate Planner, Kern County and Dorothy Torres, Energy Commission staff; March 31, 1999.

Midway (Western-Midway Sunset Co) 1999a. Application for Certification. Submitted to the California Energy Commission/Smith on December 22, 1999.

Midway (Western Midway Sunset Co) 2000c. Application for Confidential Designation: Cultural Resource Site Descriptions Submitted to the California Energy Commission on February 9, 2000.

Midway (Western Midway Sunset Co) 2000d. Supplementary AFC Material in Response to Data Adequacy Worksheets. Submitted to the California Energy Commission on February 9, 2000.

Midway (Western Midway Sunset) 2000h. supplemental Confidential Submission. Submitted to California Energy Commission on February 23, 2000.

Midway (Western Midway Sunset co) 2000m. Supplemental confidential Submission-Cultural Resource Information Submitted to the California Energy Commission on February 24, 2000.

Midway (Western Midway Sunset Co./Western) 2000s. Supplementary AFC Material in response to Data Adequacy Worksheets-POS 10 Electronic Data Files: Appendix 0-9 (Air Quality) Appendix X-4. Submitted to California Energy Commission/Dockets on May 4, 2000.

Midway (Western Midway Sunset Co./Western) 2000w. Cover letter RE: Supplemental Confidential Submission Additional Cultural Resource Information. Submitted to California Energy Commission/Larson on June 22, 2000.

Midway (Western Midway Sunset) 2000aa. Supplemental Confidential Submission. Information concerning site PL-6. Submitted to the California Energy Commission/Larson on July 10, 2000.

Midway (Western Midway Sunset) 2000bb. Supplemental Confidential Submission. Submitted to the California Energy Commission on July 28, 2000.

Moratto, Michael J. 1984. California Archaeology. Academic Press Inc., Harcourt Brace Jovanovich, Publishers. New York.

Pacific (Pacific Legacy/Jackson, Thomas L., Ph.D. and Shapiro, William A., MA) 1999. Cultural Resources Inventory for the Proposed Texaco Sunrise Cogeneration and Power Project; Addendum for Route B and Valley Acres Substation Surveys. Submitted to Radian International, Attn: David Stein. Submitted to the California Energy Commission, June 4, 1999.

SOCIOECONOMICS[1]

Testimony of Joseph Diamond, Ph.D.

INTRODUCTION

Generally, a California Energy Commission (Energy Commission) staff socioeconomic impact analysis evaluates the project induced changes on community services and/or infrastructure and related community issues such as Environmental Justice (EJ) and facility closure. Direct, indirect, and cumulative impacts are also included. This analysis discusses the potential impacts of the proposed Western Midway-Sunset Cogeneration Company Project (Western MSCC) 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 Western MSCC Project:

FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations" focuses federal attention on the environment and human health conditions of minority communities and directs agencies to achieve EJ as part of this mission. The Executive 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, SECTION 65955-659973

California Government Code Section 65955-659973 places levies against development projects near school districts. The administering agency is Kern County.

CALIFORNIA GOVERNMENT CODE, SECTION 65996-65997

As amended by SB 50 Stats. 1998, ch. 407, Sec. 23, states that public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

[1] The cumulative impacts section is a joint product of Dale Edwards and Joseph Diamond.

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) Determine the local cost of facility and infrastructure improvements and expansion that 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.

SETTING

The Western MSCC Project is located in unincorporated western Kern County. The study area (affected area), defined by Midway Sunset Cogeneration Company (MSCC) in the Socioeconomics Section of the AFC (Midway 1999a) and by staff, includes: western Kern County, Bakersfield, Maricopa, Shafter, Taft, and Wasco. The Census Designated Places (CDP) includes: Buttonwillow, Ford City, Greenacres, Lost Hills, Oildale, Rosedale, South Taft, Taft Heights and Weedpatch. These communities are within a one-way one-hour commute distance of the power plant site where construction and operations workers may live.

IMPACTS

Staff reviewed MSCC's AFC, Vol. I, December 1999, socioeconomic section (Midway 1999a) regarding potential impacts to community services and infrastructure (i.e., employment, housing, schools, utilities, emergency and other services), and EJ. Based on the socioeconomic data provided and referenced from governmental agencies, trade associations and staff's analysis, staff finds the AFC's socioeconomic analysis acceptable and agrees with its conclusions with the exception of the cumulative impacts on schools and the fire department.

For staff analysis fixed percentages are used in housing (a 5 percent or less of permanent available housing) and EJ, which has a threshold of 50 percent for minority/low-income population in the affected area or the minority population percentage is meaningfully greater than the minority percentage in the general population or other appropriate unit of geographic analysis. Criteria for subject areas such as fire protection, water supply and waste water disposal are handled in other sections. Educational impacts are subjectively determined but are moot, as described later in the testimony. And finally, impacts such as medical services, law enforcement, or community cohesion are based on subjective judgements or input from local and state agencies.

Greater non-local employment has the potential for resulting in significant impacts.

EMPLOYMENT

The Impact Analysis For Planning (IMPLAN) model (an input-output model), used in the AFC by MSCC to estimate employment impacts from the Western MSCC Project on the affected area, is widely used and acceptable to staff. The University of California at Berkeley uses the IMPLAN model for regional economic assessment. This model has also been used to assess other generating projects in the area. 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 economic activity. IMPLAN is a disaggregated type of model which divides the (regional) economy into sectors and provides a multiplier for each sector (Lewis et al. 1979). The employment multipliers used by La Paloma were also applied to Sunrise, Elk Hills, Pastoria, and the Antelope Power Project (3.23 for construction e.g., each new construction job supports approximately 2.2 indirect and induced jobs in the regional economy and 2.88 for operations with approximately 1.88 indirect and induced jobs in the regional economy (La Paloma 1998)). MSCC used an IMPLAN employment multiplier of 1.93 for construction and 2.74 for operations. These 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). These multipliers are within a range of two, often cited by many economists.

Project construction (power generation, electric power transmission, and pipelines for fuel gas, water supply, wastewater, and completion of an access road) is expected to occur over a 20-month period. The greatest number of construction workers for the power plant, estimated to be 400 workers, will be needed in the 11th and 12th months of construction. Approximately 292 of these workers are expected to come from the communities in the affected area, and approximately 108 are expected to relocate from communities outside of the one-way one-hour commute.

The number of construction workers needed outside of the peak construction period will range from 24 in the first month of construction to approximately 22 workers in the 20th month of construction. The average number of non-local workers needed for power plant construction is estimated to be 51. During operation of the project, about 5 workers will be needed to maintain and operate the project. Approximately 2 (40 percent) of these operations workers may be non-local in a worst-case scenario estimate according to the MSCC.

The total employment, estimated by MSCC, using an IMPLAN employment multiplier of 1.93 for construction, is the equivalent of 527 jobs (which includes 254 secondary jobs), based on an average of 273 project-related construction jobs (for power generation, transmission, and the water line). For project operations, an average of 5 jobs with an IMPLAN employment multiplier of 2.74 for operations results in an equivalent of 14 total jobs (which includes 9 secondary jobs).

HOUSING

Permanent housing is considered to be in short supply if the vacancy rate is less than five percent (Cleary 1989). As of 1998 (see Table 5.10-7 of the MSCC AFC),

there were approximately 85,480 housing units in Bakersfield, 3,520 in Shafter, 4,172 in Wasco, and 2,459 in Taft. There are approximately 96,086 total housing units in these communities which are within a one-hour commute. The vacancy rate for this housing averages approximately 5.4 percent. Therefore, approximately 5,229 single-family, multi-family and mobile homes are available. In addition, there are approximately 5,498 total motel/hotel rooms in the same five cities with the availability being about 30 percent on average or 1,649 rooms (LPGP 1998). A more recent estimate by John Meroski, President, Greater Bakersfield Convention and Visitors Bureau, finds the annualized occupancy rate for hotels and motels in the Greater Bakersfield area was 65.7 percent in 1999 making the vacancy rate for that time period 34.3 percent (Midway 1999a). The combination of housing and motel/hotel rooms probably available to non-local construction and operations workers for this project is more than sufficient for worker needs.

SCHOOLS

Based on an average of 51 non-local construction workers and 5 non-local plant operating personnel (assuming an average household size of 2.93 (PPP 1999), 46 school-aged children for plant construction and 2 school-aged children for plant operation are estimated to be added to the affected area schools with 66 to 70 percent going to Bakersfield based on similar projects - La Paloma, Sunrise, and Elk Hills. According to Table 8.8-4 in the Elk Hills AFC, six of thirteen affected area high schools are over capacity (EHPP 1999a). 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 but the impact will be small.

According to Senate Bill 50, which amended section 17620 of the Education Code in 1998, school funding is restricted to property taxes and statutory facility fees collected at the time the building permit is acquired (i.e., not more than $0.31 per square foot of commercial and industrial covered or enclosed space). (Govt. Code, Sec. 65995 (b)(2)). The limit of $0.31 will increase to $0.33 per square foot on July 1, 2000, and will increase every two years thereafter. (SCPP 1999, AFC page 8.8-1) MSCC has indicated that no school impact fees are applicable because none are being assessed by the Midway School District or by the Taft School District at this time (Midway 2000c).

Education Code section 17620 states that 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.” Local and state agencies are precluded from imposing (additional) fees or other required payments on development projects for the purpose of mitigating possible enrollment impacts to schools.

The life of the Western MSCC Project is estimated by the MSCC in the AFC to be a minimum of 30 years. Property taxes on the plant have been estimated to be about $2.4 million in the first year for use on infrastructure and services such as schools, government, and social programs and services with about $775,000 (almost 32 percent allocated to education excluding an additional $402,000 that goes to the

educational augmentation fund that is shared by local schools throughout the region which would make a total of 50 percent allocated to education (Midway 1999a, page 5.10-14).

UTILITIES, EMERGENCY AND OTHER SERVICES

The West Kern Water District can meet the project's water supply needs. Electricity will be provided by the existing power plant on site. During construction or operation, the project is not expected to place significant demands on the Kern County Fire Department, Sheriff, the Westside District Hospital or the five hospitals located in Bakersfield.

FINANCIAL

MSCC estimates that the construction payroll will be $25 million for the 20-month construction period, and the operation payroll will be $475,000 dollars with $300,000 for local supplies annually during operations. MSCC estimates that $22.4 to $25.2 million worth of materials and equipment will be purchased in the local area during construction. (Midway 1999a, AFC pages 5.10-11 & 12 and Midway 2000c)

ENVIRONMENTAL JUSTICE

The EJ screening analysis contained in the MSCC's AFC (Midway 1999a, AFC page 5.8-5) is consistent with the federal EJ guidelines. According to the federal EJ guidelines, a minority or low-income population exists if the minority or low-income population percentage is (a) greater than fifty percent of the affected area's general population, or (b) the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

MSCC's EJ analysis (AFC page 5.10-5 and Appendix R) indicates that there is no minority or low-income population greater than 50 percent, within one mile of the project site or within ¼-mile[2] on either side of pipelines and transmission lines except the Marisol Avenue homes near the proposed electric transmission line (17.4 miles from the Western MSCC Project site**).** In this area, 22 Hispanic people reside. **SOCIOECONOMICS Figure 1** is a map identifying the location of the Marisol Avenue neighborhood. MSCC's analysis indicates for visual resources, noise, air quality, and public health that there are no potential significant impacts related to the transmission line.

Staff's analysis in other technical areas in this Staff Assessment, notably Visual Resources, Noise, Air Quality, and Public Health (which includes electro magnetic fields) has concluded that there are no unmitigated potential significant adverse impacts associated with the Western MSCC Project.

2 Staff has defined the area within ¼-mile of the centerline of linear facilities, such as electric transmission lines, as the affected area for those facilities.

In **SOCIOECONOMICS Figure 2** and **SOCIOECONOMICS Figure 3,** the census tracts within a six-mile radius[3] **(**affected area) of the proposed Western MSCC Project site indicate the percentage of the population of low-income and minority people in those census tracts (based on 1990 U.S. Census data). Both Figures 2 and 3 demonstrate that there is no area (census tract) within the six-mile radius where the percentage of low-income or minority people exceeds 50 percent. This is based on information in **SOCIOECONOMICS Table 1, Demographic Profile for Census Tracts Within Six Miles of the Western MSCC Project Site** that indicates that the white population of the affected area is ninety percent. Therefore, staff has determined that no further EJ analysis is necessary

SOCIOECONOMICS Table 1
Demographic Profile for Census Tracts Within Six Miles of the Western MSCC Project Site

Census Tract	Hispanic Origin	White	Black	American Indian	Asian Pacific Islander	Other Race	Total by Tract
3303	58	1610	0	0	0	82	1,750
3304	56	2,171	0	19	9	221	2,476
12702	262	4,778	0	96	103	28	5,267
Totals	**376**	**8,559**	**0**	**115**	**112**	**331**	**9,493**
% of Totals	**4%**	**90%**	**0%**	**1%**	**1%**	**4%**	
Source: U.S Census. Race and Hispanic Origin population data for 1990							

3 A six-mile radius is used because it is the same radius used for staff's cumulative air quality and public health analyses, and a six-mile area captures most if not all of the area potentially impacted by the proposed power plant. The six-mile radius defines the affected area for construction and operation of the power plant unless/until more specific impact areas are determined.

SOCIOECONOMICS Figure 1

SOCIOECONOMICS Figure 2

SOCIOECONOMICS Figure 3

CUMULATIVE IMPACTS

Cumulative impacts might occur when more than one project has an overlapping construction schedule that creates a demand for workers that can not be met by local labor, resulting in an influx of non-local workers and their dependents. At the time of filing of the Western MSCC Project's AFC in December 1999, five other power plant projects were identified in the vicinity of the Western MSCC Project. MSCC's AFC included a discussion of cumulative impacts and concluded that there were none of significance but based on staff's analysis there are potential significant socioeconomic impacts to education that need not be mitigated due to current state law.

Several power plant projects in western or southern Kern County have filed AFCs. La Paloma Generating Company filed their AFC on July 15, 1998 and the project was approved on October 6, 1999. The Sunrise Cogeneration and Power Company (SCPC) filed an AFC on December 21, 1998 for a 320 MW cogeneration project which will be located near the community of Fellows. Elk Hills Power Plant Project filed an AFC on February 24, 1999 for a 500 MW combined cycle power plant to be located at Elk Hills. An AFC for Pastoria Energy Facility was filed on November 30, 1999, for 750 MW, and an AFC was filed in December 1999 for the 500 MW Western Midway Sunset Cogeneration Company Project. An AFC is expected to be filed in September 2000 for a 1000 MW Antelope Power Project to be located near California City.

SOCIOECONOMICS Table 2 shows the estimated number of workers by month for the estimated construction schedules for each of the power plant projects identified above. There are approximately four 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 610 to approximately 1,1174. For February 2000, the number of unemployed workers in the Kern County labor force was 32,300 out of a total civilian labor force of 275,000 or 11.7 percent (State of California, Employment Development Department, preliminary data, 2000).

Staff agrees that the Western MSCC Project 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 Western MSCC Project 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 forecast for local vs. non-local workers based on the

4 The number of workers for the Sunrise project's related facilities, such as the gas supply line and water line, were not available for their AFC analysis.

available work force by craft and their estimate of worker availability based on other project needs.

SOCIOECONOMICS Table 2
Cumulative Construction Workers (Estimated)

	La Paloma	Sunrise*	Elk Hills	Western Midway Sunset	Pastoria	Antelope **	Total***
Year 2000							
Jan							
Feb	53						53
Mar	76						76
Apr	46						46
May	222						222
Jun	304		111				415
Jul	403		128				531
Aug	467	64	142				673
Sep	555	75	195				825
Oct	597	96	241				934
Nov	637	142	306				1085
Dec	665	157	333				1155
Year 2001							
Jan	714	197	352				1263
Feb	729	233	347				1309
Mar	699	241	329				1269
Apr	625	255	317		25		1222
May	521	237	310	24	25		1117
Jun	399	213	231	45	55		893
Jul	195	193	158	73	80		699
Aug	141	124	124	101	120		610
Sep		104		148	180		432
Oct		78		196	275		549
Nov				250	280	48	578
Dec				307		45	352
Year 2002							
Jan				359	270	146	775
Feb				386	275	202	863
Mar				400	325	296	1021
Apr				400	330	392	1122
May				377	365	500	1242
June				251	340	614	1205
July				134	295	718	1147
Aug				90	295	772	1157
Sept				78	280	800	1158
Oct				58	240	800	1298
Nov				52	175	754	981
Dec				22	130	502	654
Year 2003							
Jan					60	268	328
Feb					40	180	220
Mar					35	156	191
Apr					50	116	166
May						104	104
Jun						44	44

* Does not include the gas line and water line workers.

** Antelope estimated to be 1000 MW has a construction workforce based on twice the construction workforce of WMSCCP at 500 MW.

*** Some project schedules appear to be slipping e.g., Sunrise and Elk Hills. This is not expected to change the analysis of no impacts but merely to stretch out the construction schedules with a largely in-county labor force rotating construction projects in a county with substantial unemployment. The information for this table is derived from AFCs and a weekly *Energy Facility Siting and Environmental Protection Division Program Status Report.*

La Paloma, the first of the six projects to start construction, estimated 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. Pastoria Energy Facility's AFC (and staff estimates this for the Antelope project as well due to its proximity to Lancaster and Palmdale in Los Angles County which has a 1999 population estimated to be 250,000 (State of California, Department of Finance 1999) estimates 92 percent local and eight percent non-local construction workers for an average period and about four percent non-local construction workers for the peak period. For peak construction of the Western MSCC Project, approximately 27 percent of the workforce will be non-local. For average and peak construction of the Western MSCC Project, approximately 27 percent of the workforce will be non-local. These estimates 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.

Based on an average of approximately 830 workers during the four months of overlapping construction for five projects, and using an IMPLAN construction employment multiplier of 3.23 approximately 1,851 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 37 months, secondary jobs, related to the construction of two or more of these projects at the same time, are expected to range from approximately 370 to 2,919. Generally, as construction of La Paloma, Sunrise, Elk Hills projects are completed, construction of Western MSCC Project, Pastoria, and Antelope projects will be built moderating the impact of overlapping power plant construction schedules.

Using an IMPLAN operation employment multiplier of 2.88, secondary jobs expected from the operation of the projects range from 111 for two projects to 205 for all six projects (based on estimates of 59 employees for La Paloma and Sunrise projects, and 109 employees for all six projects). These secondary jobs are estimated to be filled from the local work force.

Based on an estimated average of 222 non-local workers for all six projects during construction, and assuming the average family size to be 2.93 persons (PEF 1999a) approximately 207 children are estimated to be added to Kern County schools. These children will not enter and leave the schools at the same time. The increase in school enrollments due to the six projects during construction will cause a potential significant socioeconomic impact on those schools in the Bakersfield area that are currently at or over capacity. However, the increase in school enrollments due to the five projects during operation is not expected to cause an impact because students will attend many schools that are under capacity and the number is relatively small. Indeed, many non-local workers may not bring their children so the estimates could be high. Schools that are expected to handle more students

are expanding their overall capability to meet needs and school impacts fees and property taxes will help fund education.

The Kern County Fire Department (KCFD) provides emergency medical response for the proposed power plants. The KCFD believes that it has adequate resources to provide emergency medical response for the five power plants that have been identified in this cumulative analysis.

The KCFD 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 facilities such as the proposed power plants. 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, nine new personnel to cover three work shifts per day, and a replacement ladder truck approximately 15 years in the future.

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 KCFD estimates the cost of a new, properly equipped, ladder truck to be $700,000, the cost of the first year's funding for the nine new personnel to cover three shifts per day for the ladder truck to be $750,000, and the cost for the first year of a ladder truck replacement fund to be $75,000. Staff believes these costs should be paid by La Paloma (approved on October 6,1999) and the three power plant projects currently proposed for western Kern County (Sunrise, Elk Hills, and the Western MSCC Project) that will benefit directly from the new ladder truck. Because full property tax payments for these new power plants will not begin until approximately 18 months after start of construction, the fire department will require up-front payments from each of the power plant owners to cover the costs for the new ladder truck, staff for the truck, and the replacement truck fund.

The KCFD estimates that the new ladder truck will take nine months to be delivered once ordered. The need for the new ladder truck begins with the start of construction of the second power plant in western Kern County.

Staff is aware that La Paloma, LLC has signed an agreement with the KCFD on funding for the three items the fire department has identified as resource needs. This agreement involves up-front payments by La Paloma for the new truck, staffing and replacement truck fund. La Paloma will then be reimbursed by the County and/or the other power plant owners as appropriate.

According to the KCFD (Chaffin 1999), the fire department estimates that the Fire Fund share of the property taxes paid by the four projects expected in the Taft area

will be approximately $1,371,500 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. Taxes for the Western MSCC Project were estimated based on the Elk Hills project (both are 500 MW projects).

The State Board of Equalization, at an April 21, 1999 Property Tax Committee meeting, formally decided to assess only power generating facilities with a Certificate of Public Convenience and Necessity (CPCN) using unitary valuation and allocation of revenues on a countywide basis. Thus, local collection and distribution of property taxes will apply to the Western MSCC Project and other power plant projects proposed for Kern County.

The Kern County Sheriff will provide police service for the six 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 five of the six new projects, and their facility is expected to adequately meet medical service needs during construction and operation of the five new projects along with emergency services from the KCFD.

FACILITY CLOSURE

PLANNED CLOSURE

MSCC's AFC provides for the inclusion of socioeconomic LORS which will be incorporated into the facility closure plan twelve months prior to 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 Western MSCC Project would not likely cause any significant socioeconomic impacts on the affected area, because facility closure impacts, i.e., dismantling would be similar to construction impacts, and staff has found no significant socioeconomic impacts due to the construction of the project.

MITIGATION

MSCC 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 potential significant socioeconomic cumulative impact has been identified for Kern County schools during the construction period for five power plant projects in western Kern County, including the Western MSCC Project, 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. For example, during average construction there are 273 direct project-related construction jobs and 527 (273-average construction jobs x 1.93-the IMPLAN construction employment multiplier) total jobs (including power plant, transmission line, water supply pipeline) that will be created of which 254 are secondary (indirect and induced) jobs. For average operations, 5 direct jobs will be created with 9 secondary (indirect and induced) jobs for a total of 14 jobs using an IMPLAN operation employment multiplier of 2.74. The annual property tax collected by Kern County for the Western MSCC Project power plant over the first year of operation, given an estimated 30 years of expected life, was estimated to be about $2.4 million (Midway 1999a, AFC page 5.10-13 and also see Table 10-8, page 5.10-10 for additional information on property taxes and their economic impact in Kern County from the Western MSCC Project).

Staff has determined that the project will not cause a significant adverse impact either by itself or cumulatively on the affected area's housing, schools, police, fire, emergency services, hospitals, utilities and employment, if mitigation for the fire department is provided, consistent with the proposed conditions of certification.

EJ is not an issue because the minority and low-income population percentage for the affected area does not exceed 50 percent except within a quarter mile of the transmission line for a small housing community (Marisol Avenue). Staff has determined, as described in this Staff Assessment, that there are no unmitigated significant adverse environmental impacts resulting from the Western MSCC Project.

Although staff identified a potentially significant socioeconomic cumulative impact on schools as a result of the Western MSCC Project and other new power plant projects in western Kern County, mitigation for the impact on schools is not possible under current state law. A socioeconomic cumulative impact on fire protection and needed mitigation is noted in the Worker Safety and Fire Protection Testimony (Hann 2000).

The project, as proposed, is consistent with all applicable socioeconomic LORS. The proposed conditions of certification ensure compliance with LORS.

RECOMMENDATIONS

Staff recommends that if the Western MSCC Project is approved, the following proposed conditions of certification be adopted.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the statutory school impact 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 to the Compliance Project Manager (CPM) in the Monthly Compliance Report following the payment.

REFERENCES

Chafin, M. 1999. Kern County Fire Marshall. Conversation with staff on March 23, 1999.

Cleary, Cam. 1989. California Department of Housing and Community Development, Telephone conversation with Gary D. Walker, Commission Staff. November 14.

Hann, Kathleen. 2000. Energy Commission consultant. Testimony regarding Worker Safety And Fire Protection. October.

Lewis, Eugene, Russell Youmans, George Goldman, Garnet Premer. 1979. Economic Multipliers: Can a rural community use them? Western Rural Development Center 24.

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

PEF (Pastoria Energy Facility). 1999. Application for Certification, Pastoria Power Project, (99-AFC-7). Submitted to the California Energy Commission, November 30, 1999.

SCPP (Sunrise Cogeneration and Power Project) 1999. Application for Certification, Sunrise Cogeneration and power Project (98-AFC-4). Submitted to the California Energy Commission, revised January 27, 1999.

Smith, Charles. 1999. Consultant with Woodward-Clyde. Conversation with staff on January 5, 1999.

State of California, Employment Development Department, Monthly Labor Force Data for Counties, February 2000 (Preliminary).

State of California, Department of Finance. 1999. City/County Population With Annual Percent Change.

Midway (Western Midway Sunset Co.) 1999a. Application for Certification. Submitted to the California Energy Commission/Smith, December 22, 1999.

Midway (Western Midway Sunset Co.) 2000c. Supplementary AFC Material in Response to Data Adequacy Worksheets. Submitted to the California Energy Commission on February 9, 2000.

US Census 1990. “California: Preliminary Counts for Cities, Counties, and State”; April 1, 1990.

BIOLOGICAL RESOURCES

Testimony of Rick York

INTRODUCTION

This section provides the Energy Commission staff's analysis of potential impacts to biological resources from the construction and operation of the Western Midway Sunset Cogeneration Company Project (Western MSCC). This analysis addresses potential impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological concern. This analysis also describes the biological resources of the project site and at the locations of appurtenant 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 and recommends conditions of certification.

This analysis is based, in part, upon information provided in the project's Application for Certification (AFC) (Midway 1999a), workshops, site visits, staff data requests and applicant responses (Midway 2000p) and discussions with various agency representatives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicant, Midway Sunset Cogeneration Company (MSCC), will need to abide by the following laws, ordinances, regulations, and standards during project construction and operation.

FEDERAL

CLEAN WATER ACT OF 1977

Title 33, United States Code, sections 1251 – 1376, and Code of Federal Regulations, part 30, section 330.5(a)(26).

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 - 712, prohibits the take of migratory birds.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered species.

NEST OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

BIRDS OF PREY OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

MIGRATORY BIRDS – TAKE OR POSSESSION

Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird.

FULLY PROTECTED SPECIES

Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibits take of animals that are classified as Fully Protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code section 1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

CALIFORNIA CODE OF REGULATIONS

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

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.

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 that result in long-term compensation for wildlife habitat that is unavoidably damaged by energy exploration and development activities.

SETTING

REGIONAL DESCRIPTION

The proposed project is to be located on the eastern slope of the Temblor Range in the Midway Sunset oilfield of western Kern County. The Midway Sunset oilfield is a heavily disturbed area that is characterized by a variety of native and non-native plants. Plant communities found in the project region include valley saltbush scrub, non-native grassland, valley sink scrub and wetlands. Ruderal (weedy) as well as agricultural areas also exist in the project region.

This portion of western Kern County is known to have a variety of sensitive species. Many of these plant and animals are state and/or federally listed since very few populations currently exist. One of the most notable sensitive species known to occur in the project region is the San Joaquin kit fox. The San Joaquin kit fox, federally listed Endangered and state listed Threatened, was not seen during field surveys, however scat and tracks were found. Other sensitive species that were found during studies for the proposed project are blunt-nosed leopard lizard (state and federally listed Endangered), burrowing owl (California species of special concern), San Joaquin antelope squirrel (state listed Threatened), loggerhead shrike (California species of special concern), Hoover's eriastrum (federally listed Threatened and California Native Plant Society List 4) and Tejon poppy (California Native Plant Society List 1B).

For a complete list of sensitive plant and animal species that were considered by the applicant for the proposed project, refer to Biological Resources Table 1, below.

BIOLOGICAL RESOURCES - Table 1
Sensitive Species

Sensitive Plants	Status*
San Joaquin woollythreads (*Lembertia congdonii*)	FE/CNPS 1B
California jewelflower (*Caulanthus californicus*)	FE/CE/CNPS 1B
Kern mallow (*Eremalche kernensis*)	FE/CNPS 1B
Hoover's eriastrum (*Eriastrum hooveri*)	FT/CNPS 4
Gypsum-loving larkspur (*Delphinium gypsophilum* ssp. *gypsophilum*)	CNPS 4
Forked fiddleneck (*Amsinckia vernicosa* var. *furcata*)	CNPS 1B
Recurved larkspur (*Delphinium recurvatum*)	CNPS 1B
Cottony buckwheat (*Eriogonum gossypinum*)	CNPS 1B
Tejon poppy (*Eschscholzia lemmonii* ssp. *kernensis*)	CNPS 1B
Heartscale (*Atriplex cordulata*)	CNPS 1B
Lost Hills saltbush (*Atriplex vallicola*)	CNPS 1B
Bakersfield saltbush (*Atriplex tularensis*)	CE/CNPS 1B
Slough thistle (*Cirsium crassicaule*)	CNPS 1B
Bakersfield cactus (*Opuntia basilaris* var. *treleasei*)	FE/CE/CNPS 1B
Oil nestraw (*Stylocline citroleum*)	CNPS 1B

Sensitive Wildlife	Status*
San Joaquin antelope squirrel (*Ammospermophilus nelsoni*)	CT
Giant kangaroo rat (*Dipodomys ingens*)	FE/CE
San Joaquin pocket mouse (*Perognathus inornatus neglectus*)	FSC
Tulare grasshopper mouse (*Onychomys torridus tularensis*)	CSC
American badger (*Taxidea taxus*)	CSC
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE/CT
California condor (*Gymnogyps californianus*)	FE/CE
Golden eagle (*Aquila chrysaetos*)	CSC
Swainson's hawk (*Buteo swainsonii*)	FSC/CT
Northern harrier (*Circus cyaneus*)	CSC
Burrowing owl (*Athene cunicularia*)	CSC
LeConte's thrasher (*Toxostoma lecontei*)	CSC
Prairie falcon (*Falco mexicanus*)	CSC
Peregrine falcon (*Falco peregrinus anatum*)	CE
Long-eared owl (*Asio otis*)	CSC
Mountain plover (*Charadrius montanus*)	FPT/CSC
California horned lark (*Eremophila alpestris actia*)	CSC
Loggerhead shrike (*Lanius ludovicianus*)	FSC/CSC
Western spadefoot toad (*Scaphiopus hammondii*)	FSC/CSC
Blunt-nosed leopard lizard (*Gambelia silus*)	FE/CE/CFP
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT

*STATUS – FE = Federally listed Endangered; FT = Federally listed Threatened; FPT = Federal proposed Threatened; CNPS List 1B = Rare and endangered plants of California and elsewhere, and CNPS List 4 = Plants of Limited Distribution (California Native Plant Society 1994); CE = State listed Endangered, CT = State listed Threatened; CSC = State Species of Special Concern; and CFP = State Fully Protected.

POWER PLANT SITE AND ANCILLARY FACILITIES HABITAT DESCRIPTIONS

POWER PLANT SITE AND CONSTRUCTION LAYDOWN AREA

The proposed power plant site, located due west of the existing Midway Sunset power plant, will occupy approximately 10 acres and is currently non-native grassland habitat. The proposed construction laydown, located due south of the proposed project site area, will temporarily occupy approximately 7 acres of non-native grassland habitat.

TRANSMISSION LINE

The proposed project will require the construction 19 miles of new transmission line to connect the new project with Midway substation located east of Buttonwillow. Construction of the new transmission line will permanently impact a variety of habitat types, including valley saltbush scrub, grasslands, valley sink scrub, ruderal, and agricultural areas. Approximately 55 acres of habitat will be temporarily impacted and approximately 0.1 acres will be permanent impacted by construction of the proposed new transmission line.

WATER SUPPLY PIPELINE

The proposed project will require the construction of a new 1.8-mile water supply pipeline. Construction of this water supply pipeline will temporarily disturb a total of 2.0 acres of ruderal habitat.

FUEL GAS SUPPLY PIPELINE

The proposed fuel gas supply pipeline will connect directly to the existing Midway Sunset power plant, located immediately adjacent to (east of) the proposed project. No new habitat disturbance will occur as a result of the construction of the new fuel gas supply pipeline.

IMPACTS

PROJECT SPECIFIC DIRECT IMPACTS

In the California Environmental Quality Act Guidelines, direct impacts are defined as those impacts that are directly attributable to the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance, but are still reasonably foreseeable and related to the project.

The proposed project may directly impact a variety of state and federally listed species known to occur in the project vicinity. To address concerns about these potential impacts, the applicant has proposed a variety of mitigation measures they intend to employ to help minimize, or totally avoid, impacting individual sensitive species and their habitat (Midway 1999a and Midway 2000p). The final list of biological resources mitigation measures will be completed in consultation with the

California Department of Fish and Game (CDFG), the Bureau of Land Management (BLM), the U. S. Fish and Wildlife Service (USFWS), and Energy Commission staff, to be included in the project's final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). For more information about specific mitigation measures and the project's BRMIMP, refer to Biological Resources Conditions of Certification **BIO-8**.

Loss of sensitive species habitat is staff's primary concern since conversion of habitat by agriculture and industrial and urban development have eliminated these species from the majority of their historic range (USFWS 1998). Information provided by the applicant (Midway 2000p) has quantified the project's anticipated direct (temporary and permanent) acreage impacts. The following table identifies the project's anticipated direct acreage impacts to sensitive species habitat.

BIOLOGICAL RESOURCES - Table 2
DIRECT IMPACTS ACREAGES
(Midway 1999a and Midway 2000p)

Project facility	Permanent Impacts Acreage	Temporary Impacts Acreage
Power plant	10.0	--
Construction laydown area	--	7.0
Transmission line	0.2	55.0
Water supply pipelines	0.01	0.25
IMPACT ACREAGE TOTALS	**10.2 acres**	**62.25 acres**

INDIRECT IMPACTS

Staff does anticipate that the proposed project will have any indirect effects.

CUMULATIVE IMPACTS

The California Environmental Quality Act defines cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Cumulative impacts can occur when individually minor but collectively significant projects taking place over time.

This project will, if built, be located in an area of western Kern County that has not experienced development, however staff expects that additional energy development will occur over time. Four additional power plants (La Paloma, Sunrise Cogen, Pastoria and Elk Hills), in addition to this project, may be built in the region in the near future.

All of this regional energy development has the potential to impact sensitive species and their habitats. As an example, vehicles may hit individual sensitive species and permanent habitat losses will occur as projects are constructed.

Because there are so many sensitive species in the region, the USFWS requires regional strategies to minimize impacts to sensitive species and their habitat. In

addition, this project will be required to abide by the conditions of certification established by Energy Commission staff to avoid impacts whenever possible, and to minimize impacts when impacts are unavoidable.

Habitat loss in Kern County is an ongoing regional concern of the CDFG, USFWS, BLM and the Energy Commission. To address this issue, CDFG and the USFWS require habitat compensation when habitat losses are anticipated for all development projects, including energy projects.

For the Western MSCC project, the applicant has indicated (Midway 2000p) that they intend to provide suitable habitat compensation funds to mitigate the project's habitat impacts. The applicant has also indicated that they intend to implement take avoidance measures to minimize impacts to individual listed species. Habitat compensation will involve the purchase of an agreed-to amount of compensation habitat and the establishment of a suitable endowment to guarantee perpetual care of the compensation habitat.

The details regarding the amount and the location of the habitat compensation is not completely identified as of this staff assessment. The applicant has expressed a willingness to consider providing their habitat compensation to the Center for Natural Lands Management (CNLM). CNLM manages several preserves in Kern County, including the Lokern Preserve, located approximately 10 airmiles northeast of the proposed project site. The Lokern Preserve currently encompasses more than 3500 acres, and is located within a much larger planning area identified as the Lokern Natural Area. The 44,000 acre Lokern Natural Area has been identified by CDFG, USFWS, BLM and the Energy Commission and other state, federal, and county agencies as an area needing protection since it is relatively undisturbed and contains significant listed species populations.

In addition to this project, other energy projects (La Paloma, Sunrise, Pastoria and Elk Hills) have also agreed to provide their habitat compensation funds to CNLM to purchase habitat as part of the Lokern Preserve.

By expressing a willingness to provide its habitat compensation to CNLM and institute sensitive species take avoidance measures, the applicant will not only be addressing its direct habitat compensation responsibilities, but also lessening staff's concern that the project will contribute to any cumulative species or habitat losses. The project's habitat compensation will occur within the region that is to be impacted, and the compensation will be provided to an existing regional preserve to address the regional habitat loss problem associated with continuing energy development. In addition, far more habitat will be protected than is being impacted, and the protected habitat will be of much higher quality than that which is being impacted.

For these reasons, staff does not believe that the project will create any incremental effects that are cumulatively considerable, and the combined impacts associated with the proposed project's incremental effect and the effects of other related projects is considered insignificant.

FACILITY CLOSURE

Sometime in the future, the Western MSCC project will either experience 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-10**). Facility Closure mitigation measures will also be included in the Biological Resources Mitigation Implementation and Monitoring Plan. For more information about this plan, refer to Biological Resources Condition of Certification **BIO-8**.

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 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 case 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 plant species and 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 if an unexpected temporary closure of the MSCC power plant. 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

APPLICANT'S PROPOSED MITIGATION

IMPACT AVOIDANCE MEASURES

The applicant has suggested (Midway 2000p) that the following wildlife impacts avoidance measures be implemented:

- Site transmission line poles, access roads, pulling sites, and storage and parking areas to avoid sensitive species whenever possible.
- Establish appropriately sized avoidance zones to avoid impacting potential, known, and natal San Joaquin kit fox dens.
- Avoid all wetlands, where appropriate, and minimize disturbance to “waters” and wetlands during construction of the linear components.
- Design and construct transmission lines and poles to reduce the likelihood of electrocutions of large birds.
- Institute specific take avoidance measures for the blunt-nosed leopard lizard to assure that take will not occur.
- Hire a biologist, who is acceptable to the Energy Commission and the USFWS, to conduct pre-construction surveys no more than 14 days prior to initiation of construction in any portion of the project area.
- Clearly mark construction area boundaries with stakes, flagging, and/or rope to minimize inadvertent degradation or loss of adjacent habitat during facility construction.
- Store equipment in designated construction zones or areas that are not currently considered sensitive species habitat.
- Post signs and/or fence the power plant site and laydown area to restrict vehicle access to designated areas.
- Institute traffic restraints and signs to minimize temporary disturbance.
- Hood night lighting during construction to avoid attracting nocturnal wildlife species.
- Provide wildlife escape ramps for construction areas that contain steep-walled holes or trenches.
- 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.
- 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.
- Make certain that all food-related trash is disposed of in closed containers and removed at least once a week. Feeding of wildlife shall be prohibited.
- Prohibit firearms except for those carried by security personnel.
- Prohibit pets from the project site.
- Minimize the use of rodenticides and herbicides in the project area.
- Consult the USFWS and the Energy Commission regarding appropriate protection measures for sensitive species following resolution of an emergency that takes place in sensitive species habitat during clean-up activities.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

The applicant has provided (Midway 2000p) a draft worker environmental awareness program outline.

DESIGNATED BIOLOGIST

The applicant has recommended that a biologist be hired, and approved by the Energy Commission and the USFWS, that has appropriate education and field experience suitable to the proposed project. This biologist shall advise the project owner on the implementation of various biological resource mitigation compliance measures and supervise other biologists implementing required mitigation measures.

HABITAT RECLAMATION

The applicant proposes to complete the following habitat reclamation:

- Recontour areas temporarily disturbed;
- Allow areas to revegetate; and
- Re-spread salvaged topsoil

COMPLIANCE REPORTING

The applicant has suggested the following compliance reporting strategy:

- Conduct compliance inspections once per week and provide an annual compliance report to the Energy Commission and the USFWS.
- Provide a post-construction compliance report, within forty-five (45) calendar days of completion of the project, to the Energy Commission and the USFWS.

HABITAT COMPENSATION

The applicant proposes to acquire compensation lands to satisfy the requirements of the federal endangered species act. Habitat compensation will be consistent with standard USFWS compensation requirements for impacts to listed species habitat. The applicant proposes that title of the compensation habitat be transferred to a suitable land management institution. The applicant also proposes to provide an endowment for the perpetual care of the compensation habitat.

The applicant has proposed (Midway 2000p) two strategies:

1. Acquire the appropriate acreage either as a conservation easement or in fee title, deed it to an acceptable land manager (e.g. CDFG or the Center for Natural Lands Management) and provide funds for habitat enhancements and an endowment, or
2. Purchase habitat compensation credits at a conservation area such as the Lokern Preserve.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

The applicant has provided a draft Biological Resources Mitigation Implementation and Monitoring Plan (Midway 2000p) for review and approval by the Energy Commission and the USFWS.

FACILITY CLOSURE PLAN

The applicant has proposed to incorporate measures into the planned permanent or unexpected permanent closure plan that will be required for this project to address the local biological resources during facility closure.

STAFF'S RECOMMENDED MITIGATION

IMPACT AVOIDANCE MEASURES

Staff recommends that the applicant's recommended sensitive species impact avoidance measures be incorporated into their draft Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-8**.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

Staff supports the applicant's recommendation that a Worker Environmental Awareness Program be developed and approved by the Energy Commission. This program must be implemented to inform all employees, including employees of contractors, of the sensitive biological resources associated with the proposed Western Midway Sunset project. For more information about the Worker Environmental Awareness Program, refer to Biological Resources Condition of Certification **BIO-4**.

DESIGNATED BIOLOGIST

Staff supports the applicant's recommendation that the project owner designate a qualified biologist to act as the project's Designated Biologist. The Designated Biologist must be identified and approved prior to project construction, and will be responsible for making certain that the project is constructed and operates in compliance with all state and federal biological resources laws, ordinances, regulations, and standards. For more information about the Designated Biologist, refer to Biological Resources Conditions of Certification **BIO-1**, **BIO-2**, and **BIO-3**.

HABITAT RECLAMATION

Staff supports the applicant's recommendation that the project owner implement required habitat reclamation measures. These habitat reclamation measures will be included in the project's BRMIMP. Habitat reclamation measures required for temporary impacts to stream crossings are included in a CDFG Streambed Alteration Agreement, however CDFG has concluded that this project will not need to acquire such an agreement (Gordus 2000). For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-8**.

COMPLIANCE REPORTING

The applicant's recommended compliance reporting will be reviewed and approved by Energy Commission staff, CDFG and the USFWS then included in the project's BRMIMP. For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-8**.

HABITAT COMPENSATION

The sensitive species list for Kern County is long because a significant portion of the natural habitat has been lost to various types of development, including energy development and agriculture. To adequately address habitat loss associated with the Western Midway Sunset project, the applicant has proposed that mitigation funds be provided for habitat compensation.

Habitat compensation ratios to calculate the amount of compensation acreage to be purchased to compensate for the acreage to be disturbed have been developed for similar project in Kern County. The following habitat compensation ratios (numbers of acres to be purchased for each acre to be impacted) have been recommended by staff and agreed to by the USFWS and the applicant:

TYPE OF HABITAT IMPACT	COMPENSATION RATIO
Permanent impacts to conserved habitat	4.0:1
Permanent impacts to other private habitat	3.0:1
Temporary impacts to conserved habitat	2.1:1
Temporary impacts to other private habitat	1.1:1

As of June 2000, the applicant has identified (Midway 2000p) that the project's expected direct habitat impacts will result in the following permanent and temporary acreage losses and requires the following habitat compensation:

	Impact Acreage	X	Compensation Ratio	=	Compensation Acreage
Permanent loss of conserved habitat	0.1	X	4.0:1	=	0.4-acres
Permanent loss of private habitat	10.1	X	3.0:1	=	30.3-acres
Temporary loss of conserved habitat	0.0	X	2.1:1	=	0.0-acres
Temporary loss of private habitat	62.25	X	1.1:1	=	68.5-acres
TOTAL COMPENSATION ACREAGE					**99.2-acres**

Staff recommends that the required compensation funds be provided by the project owner to the Center for Natural Lands Management (CNLM). Staff also recommends that the funds be used to purchase no less than **99.2-acres** of compensation habitat in the immediate vicinity of CNLM's Lokern Preserve within the Lokern Natural Area of western Kern County.

It is staff's opinion that the location of the proposed habitat compensation will, when completed, provide a significant overall net benefit to the region's sensitive species and habitat protection efforts since at least 99.2-acres of high quality habitat will be purchased and protected as part of the Lokern Preserve. The Lokern Preserve represents an important tool in regional efforts to protect significant portions of remaining sensitive species habitat. The USFWS (Miller 2000) supports staff's

recommendation that the habitat compensation funds be provided to CNLM so habitat compensation can occur at the Lokern Preserve within the Lokern Natural Area.

Staff consulted Brenda Pace, CNLM Administrative Director, to find out how much money is needed per acre for CNLM to assume responsibility for purchasing the compensation habitat and add the acreage to the Lokern Preserve. Ms. Pace indicated (Pace 2000) that the required amount must be large enough to cover all acreage purchases, as well as all administrative costs including initial and capital costs, and the establishment of a suitable endowment for perpetual management of the habitat. Ms. Pace indicated that CNLM will require **$1,500** per acre to assume responsibility for purchasing the compensation habitat and add it to the Lokern Preserve.

Staff recommends that the applicant provide **$148,800** (99.2-acres X $1,500 per acre) to CNLM prior to the start of any project-related ground disturbance activity to compensate for project-related habitat impacts.

Additional habitat compensation funds may be required if more habitat is disturbed during project construction than is anticipated. For additional information about the required habitat compensation, refer to Biological Resources Condition of Certification **BIO-9**.

The habitat compensation strategy to be implemented by the applicant must also be described in the project's final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-8**.

CALIFORNIA CONDOR

The California condor, a state and federally listed endangered species is known to occur in the region of the proposed project. The condor is known to experience difficulties such as electrocution and collisions when they come in contact with electrical distribution and transmission lines. The proposed design of the new transmission line towers should make it highly unlikely that the condor could complete a circuit and be electrocuted. However the condor could collide with the ground wire that runs between the tops of the towers since it is often much smaller diameter wire than the conductor. For this reason, staff recommends that bird flight diverters be installed to manufacturer's specifications the entire length of the ground wire of the new transmission line. For more information about this issue, see Biological Resources Condition of Certification **BIO-7**.

CDFG INCIDENTAL TAKE PERMIT

Staff requires that the project owner acquire a CDFG Incidental Take Permit and implement its terms and conditions to comply with the state Endangered Species Act. For more information about CDFG's Incidental Take Permit, refer to Biological Resources Condition of Certification **BIO-6**.

KIT FOX DENS

At least 3 known kit fox dens and 3 potential kit fox dens were found during 1999 field surveys. These dens need to be avoided during project construction. If potential and known kit fox dens within the direct project footprint can not be avoided during construction then the dens must be carefully excavated to ensure that no kit fox or other federally listed species are inside. Prior permission from the USFWS will be required.

The applicant has proposed to construct artificial dens to replace known dens that are destroyed during construction. Unfortunately, kit fox rarely use artificial dens in the Lokern area (Spiegel 2000). The USFWS recommends (Miller 2000), and staff supports, that instead of constructing new artificial dens that the following mitigation strategy be followed:

- Potential den covered with plywood for more than 30 days — preserve 0.1 acre per den
- Potential den excavated — preserve 0.3 acre per den
- Known or suspected non-natal den disturbed — preserve 0.5 acre per den
- Known or suspected non-natal den excavated — preserve 1.0 acre per den
- Known or suspected natal den disturbed — preserve 5 acres per den
- Known or suspected natal den excavated — preserve 10 acres per den

See condition of certification **BIO-8** for more information about biological resources mitigation measures.

AVOIDANCE AREAS

The USFWS provided guidance (Miller 2000) regarding avoidance radii to be implemented during project construction to facilitate avoidance of sensitive species. Staff recommends that the following avoidance zone strategy be implemented:

- 50 feet for currently unoccupied potential earthen and atypical non-natal dens for kit foxes;
- 100 feet for currently unoccupied earthen and atypical non-natal dens known to be previously used by kit foxes;
- 1000 feet for currently unoccupied natal dens for kit foxes during December through July (500 feet during the remainder of the year);
- 500 feet for earthen and atypical non-natal dens suspected or known to be currently occupied by kit foxes;
- For natal dens suspected or known to be occupied by kit foxes, contact the Service;
- 50 feet for currently unoccupied burrows known to be previously used Tipton kangaroo rats, giant kangaroo rats, or leopard lizards;

- 100 feet for burrows known or suspected to be currently occupied by Tipton kangaroo rats, giant kangaroo rats, or leopard lizards;
- 50 feet from the outer edge of populations of Hoover's woolly-star (which appear to readily re-colonize disturbed areas if nearby seed sources are available);
- 100 feet from the outer edge of populations of other federally listed or proposed plant species; and
- 1,000 feet from the outer edge of vernal pool complexes (Note: The formation and persistence of vernal pools requires the presence of impermeable surface or subsurface soil layers that inhibit water percolation and result in a perched water table during the rainy season and the following spring. Hence, the hydrology of vernal pools is dependent not only on the frequency and duration of the local seasonal rainfall, but also the maintenance of adjacent geomorphology and ecosystem processes).

VERNAL POOL SURVEYS

Vernal pool surveys were not completed in 1999 along the proposed transmission line route. Staff recommends that vernal pool surveys be completed during the appropriate hydrological conditions before vegetation clearing and ground disturbance activities occur along the proposed transmission line route. Survey results will be provided in the project's final BRMIMP and, if appropriate, avoidance measures to be implemented if listed species are found.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

Staff supports the applicant's proposal to create, and receive approval for, the project's Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). Staff recommends that a revised draft BRMIMP be provided to staff, USFWS, and CDFG prior to the evidentiary hearings. For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-8**.

FACILITY CLOSURE

Staff supports the applicant's proposal to include recommendations on addressing the local biological resources in the project's closure plan when the project is to be closed. Closure plan biological resource recommendations will also be included in the project's BRMIMP. For more information about facility closure conditions, refer to Biological Resources Condition of Certification **BIO-10**. For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-8**.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

To be in compliance with all state and federal endangered species laws, the applicant must obtain, build and operate the proposed project in accordance with the terms and conditions provided in a federal (USFWS) Section 7 Biological Opinion and a state (CDFG) Section 2081.1 Incidental Take Permit. For further

information on these documents, see Biological Resources Conditions of Certification **BIO-5 and BIO-6**.

To make certain the project owner complies with all laws, ordinances, regulations, and standards and the biological resource mitigation measures associated with this project, the applicant must designate a biological resource specialist, prior to the beginning of any project-related ground disturbance, who is familiar with the biological resource issues of the project. This specialist, identified as the Designated Biologist, will help ensure that all biological resources mitigation measures are complied with during project construction and operation. For more information about the roles and responsibilities of the Designated Biologist, see Biological Resource Conditions of Certification **BIO-1**, **BIO-2**, and **BIO-3**.

UNRESOLVED ISSUES, CONCLUSIONS, AND RECOMMENDATIONS

UNRESOLVED ISSUES

FEDERAL BIOLOGICAL OPINION

Since the project may impact federally listed species, in particular the San Joaquin kit fox and the blunt-nosed leopard lizard, the applicant must acquire a federal Section 7 Biological Opinion from the USFWS. The federal Biological Opinion has not yet been provided, and will most likely not be provided until after the evidentiary hearings and possibly not until after the Commission Decision.

EXISTING ARTIFICIAL KIT FOX DENS

Several artificial kit fox dens were constructed in the mid-1980's for the existing Midway Sunset power plant as part of an overall agency/applicant mitigation agreement to address impacts to the San Joaquin kit fox. The current project will require the removal of two artificial dens, so staff will work with the applicant, CDFG, USFWS, and BLM to decide whether the artificial dens that need to be removed will be established elsewhere. In addition, staff intends to resolve how the remaining artificial dens will be addressed and make the final resolution regarding these dens part of this project's mitigation package.

VERNAL POOL AND VERNAL POOL FAIRY SHRIMP SURVEYS

The applicant did not indicate that vernal pools were surveyed during 1999 field surveys along the proposed transmission line route. As a result, the USFWS recommends (Miller 2000) that surveys for vernal pools and the federally listed Endangered vernal pool fairy shrimp (*Branchinecta lynchi*) be completed during appropriate hydrological conditions before vegetation clearing or ground disturbance activities occur along the proposed transmission line route.

STATE INCIDENTAL TAKE PERMIT

CDFG will require this project to secure a state Incidental Take Permit to comply with the state's Endangered Species Act. Once this permit is secured, the project owner will need to incorporate the take permit's terms and conditions into its

BRMIMP prior to any ground disturbance activity and implement the required mitigation measures during project construction and operation. The permit has not yet been provided, however CDFG reports (Gordus 2000) that the applicant has applied for the permit. The Incidental Take Permit will be provided to the applicant within 30 days of the Commission Decision being available.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP)

The applicant has provided a draft BRMIMP (Midway 2000p) to staff and other interested agencies. The draft BRMIMP must be reviewed by all interested parties, and comments and suggested improvements must be provided to the applicant. All necessary improvements to the plan need to be made prior to the evidentiary hearings.

CONCLUSIONS

Several important issues are currently unresolved, and various draft documents are not completed, so staff can not make a recommendation regarding whether or not this project should be certified. Completion of these documents and resolution of various unresolved issues will make it far easier for staff to conclude whether the project can be constructed and operated in compliance with various state and federal laws, ordinances, regulations, and standards and whether project approval is recommended.

RECOMMENDATIONS

To make certain that the project complies with all laws, ordinances, regulations, and standards during project construction and operation, staff recommends that the Energy Commission adopt the following Biological Resources Conditions of Certification.

CONDITIONS OF CERTIFICATION

The following Biological Resources Conditions of Certification are proposed by Energy Commission staff.

DESIGNATED BIOLOGIST

BIO-1 Site mobilization (described as any ground disturbing activity other than Energy Commission approved geotechnical work) shall not begin until an Energy Commission CPM-approved Designated Biologist is available to be on site.

Protocol: The Designated Biologist (DB) must meet the following minimum qualifications:

1: A Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;

2. At least three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;

3. At least one year of field experience with biological resources found in or near the project area; and

4. 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 DB to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved DB needs to be replaced, the project owner shall obtain approval of a new DB 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 DB and the new biologist is on site.

Verification: At least 90 days prior to the start of site mobilization, 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 DB. If a DB 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 DB.

BIO-2 The CPM approved Designated Biologist (DB) shall perform the following during project construction and operation:

1. Advise the project owner's Construction Manager 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 non-compliance with any Biological Resources Condition of Certification.

Verification: During project construction, the DB 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 DB shall submit record summaries in the Annual Compliance Report.

BIO-3 The project owner's Construction Manager shall act on the advice of the DB to ensure conformance with the Biological Resources Conditions of Certification.

Protocol: The project owner's Construction Manager shall halt, if necessary, all construction activities in areas specifically identified by the DB as sensitive to assure that potential significant biological resource impacts are avoided.

The Designated Biologist shall:

1. Inform the project owner and the Construction Manager when to resume construction, and
2. Advise the Energy Commission CPM if any corrective actions are needed or have been instituted.

Verification: Within two (2) working days of a DB notification of non-compliance with a Biological Resources Condition of Certification 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 (5) 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-4 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 during construction and operation, are informed about the sensitive biological resources associated with the project area.

Protocol: The Worker Environmental Awareness Program must:

1. Be developed by the DB 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 (e.g. requirements of the state and federal Endangered Species Acts);

4. Present the meaning of various temporary and permanent habitat and species 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 DB.

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 site mobilization activities, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the DB 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.

U. S. FISH & WILDLIFE SERVICE SECTION 7 BIOLOGICAL OPINION

BIO-5 Prior to the start of any site mobilization activities, the project owner shall provide the CPM with a final copy of the project's Section 7 Biological Opinion obtained from the U. S. Fish and Wildlife Service in accordance with the federal Endangered Species Act.

Verification: At least 60 days prior to the start of any site mobilization activities, the project owner shall submit to the CPM a copy of the federal Section 7 Biological Opinion. The Section 7 Biological Opinion terms and conditions will be incorporated into the final BRMIMP and implemented during project construction and operation. For more information about the BRMIMP, see Biological Resources Condition of Certification **BIO-8**, below.

CALIFORNIA DEPARTMENT OF FISH AND GAME INCIDENTAL TAKE PERMIT

BIO-6 Prior to the start of any site mobilization activities, the project owner shall provide the CPM with a final copy of the project's CDFG Incidental Take Permit in accordance with the state Endangered Species Act.

Verification: At least 60 days prior to the start of any site mobilization activities, the project owner shall submit to the CPM a copy of the CDFG Incidental Take Permit. The Incidental Take Permit terms and conditions will be incorporated into the final BRMIMP and implemented during project construction and operation. For more information about the BRMIMP, see Biological Resources Condition of Certification **BIO-8**, below.

CALIFORNIA CONDOR BIRD FLIGHT DIVERTERS

BIO-7 During construction of the new Western Midway Sunset project transmission line, the power plant owner will install USFWS-approved bird flight diverters on the new transmission line ground wire(s).

Protocol: Bird flight diverters must be:

1. Installed to manufacturer's specifications;

2. Replaced when damaged or deemed defective; and

3. Maintained for the full length of the transmission line for the life of the facility.

Verification: No later than 10 days prior to energizing the new transmission line, the project owner will provide photographic verification to the Energy Commission CPM that all required bird flight diverters have been installed, according to manufacturer's specifications, for the full length of the new transmission line.

The project's final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) will provide complete guidance regarding bird flight diverter installation and maintenance. For more information regarding the project's BRMIMP, see Biological Resources condition of certification **BIO-8**.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-8 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. Any changes made to the adopted BRMIMP must be made in consultation with Energy Commission staff, CDFG and the USFWS.

Protocol: The final BRMIMP shall identify:

1. All biological resources mitigation, monitoring, and compliance conditions included in the Energy 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 identified in the USFWS Section 7 Biological Opinion including requirements for, but not restricted to, preconstruction survey, kit fox den excavation and replacement strategy, small mammal trapping methods, nest surveys, avoidance area distances, blunt-nosed leopard lizard avoidance measures, delineation of work areas, signage, vehicle speeds, agency contacts/reporting, USFWS work inspections, construction hours, prevention of entrapment of wildlife during construction, firearms

restrictions, trash control, worker environmental awareness training, use of rodenticides/herbicides, project lighting, handling of emergencies, habitat compensation, and habitat restoration measures.

4. Required habitat compensation strategy, including provisions for acquisition, enhancement and management, for any temporary and permanent loss of sensitive biological resources;

5. All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;

6. Aerial photographs of all areas to be disturbed during project construction activities - one set prior to site disturbance and one set after completion of mitigation measures. Include planned timing of aerial photography and a description of why times were chosen;

7. Duration for each type of monitoring and a description of monitoring methodologies and frequency;

8. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

9. All remedial measures to be implemented if performance standards are not met;

10. A discussion of biological resource-related facility closure measures;

11. An agency-approved strategy to address the final disposition of the artificial kit fox dens constructed for the Midway Sunset project that will be addressed by the current project;

12. A process for proposing plan modifications to the Energy Commission CPM and appropriate agencies for review and approval; and

13. Results of vernal pool fairy shrimp surveys and avoidance measures to be implemented if vernal pool fairy shrimp are found along proposed transmission line route.

Verification: At least 60 days prior to start of any site mobilization activities, the project owner shall provide the CPM with the final version of the BRMIMP, and the CPM will determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved BRMIMP must be made only after consultation with Energy Commission staff, CDFG and the USFWS. The project owner shall notify the CPM five (5) working days before implementing any CPM approved 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-9 To compensate for temporary and permanent impacts to sensitive species habitat, the project owner will provide no less than $148,800 to the Center for Natural Lands Management.

Verification: To account for inflation and other anticipated changes in habitat compensation costs, the project owner will consult the Center for Natural Lands Management (Brenda Pace, 541 330-5533) no less than 90 days prior to the start of any project related ground disturbance, and CNLM will identify the final cost per acre and total compensation amount. Once the final habitat compensation amount has been determined and no less than 60 days prior to the start of any project related ground disturbance activities, the project owner will provide written verification to the CEC CPM that all habitat compensation funds (including the endowment) have been provided to CNLM.

Within 90 days after completion of project construction, the project owner shall provide aerial photographs to the CPM that were taken after construction. The project owner will also provide an analysis of the amount of any additional habitat disturbance than that identified in this 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-10 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 Western Midway Sunset Project BRMIMP.

Protocol: The planned permanent or unexpected permanent closure plan will require a discussion of the feasibility of 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.

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.

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 Native Plant Society. 1994. California Native Plant Society Inventory of Rare and Endangered Vascular Plants of California. Special Publication Number 1, 5th edition.

Gordus, Andy. 2000. Personal communication with Rick York regarding state Incidental Take Permit and Streambed Alteration Agreement. October 4, 2000.

Midway. 1999a. Application for certification. Submitted to the California Energy Commission on December 22, 1999.

Midway. 2000p. Data request responses (#2). Prepared by WZI Inc. June 2000.

Miller, Karen. 2000. Letter to Larry Saslaw (Bureau of Land Management, Bakersfield) regarding comments on Energy Commission Preliminary Staff Assessment. October 5, 2000.

Pace, Brenda. 2000. Personal communication with Rick York regarding habitat compensation costs for the Lokern Preserve. June 19, 2000.

Spiegel, Linda. 2000. Personal communication with Rick York. October 13, 2000.

Therkelsen, Robert. 2000. Letter to Karen Miller of the USFWS regarding growth-inducing impacts and power plant development in California. Letter dated February 3, 2000.

USFWS (U. S. Fish and Wildlife Service) 1998. Recovery plan for upland species of the San Joaquin Valley, California.

SOIL & WATER RESOURCES

Testimony of
Jack Buckley, Joe Crea, Jim Henneforth and Joe O'Hagan

INTRODUCTION

This section of staff's Final Staff Assessment (FSA) analyzes potential effects on soil and water resources by the proposed Western Midway Sunset Cogeneration Company (Western MSCC) Project, specifically focusing on the potential for the project to induce erosion and sedimentation, adversely affect surface and groundwater supplies, and degrade surface and groundwater quality. Also addressed by staff in this analysis is the project's ability to comply with all applicable federal, state and local laws, ordinances, regulations and standards. Where the potential for impacts is identified, staff proposes mitigation measures to reduce the significance of the impact and, as appropriate, recommends conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

CLEAN WATER ACT

The Clean Water Act (33 USC § 1251), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States.

Section 401 of the Act requires that any applicant for a federal permit to conduct any activity, including the construction or operation or a facility, which may result in the discharge of any pollutant, must obtain certification of those activities from the state in which the discharge originates. For the Western MSCC project, any activity that occurs within the bed and banks of a watercourse will be subject to 401 certification by the Central Valley Regional Water Quality Control Board (RWQCB).

The Clean Water Act requires states to set standards to maintain, restore, and protect water quality through the regulation of point source and certain non-point source discharges to surface water. These discharges are regulated through requirements under Section 402 of the Clean Water Act. Section 402(p) established the National Pollutant Discharge Elimination System (NPDES) permitting program for stormwater and incidental non-stormwater discharges from construction activities that disturb five (5) or more acres of soil. The NPDES program is administered by the U.S. Environmental Protection Agency (EPA); and, in California, NPDES permitting authority is delegated to, and administered by, the nine Central Valley Regional Water Quality Control Boards (CVRWQCB). Stormwater discharges

during construction and operation of a facility are addressed through a General Construction Activity and Industrial Activity NPDES permits.

Section 402 of the Clean Water Act regulates the discharge of fill or dredged material into waters of the United States, including rivers, streams, and wetlands. Such discharges are covered under Section 404 of the Clean Water Act. The Section 404 permit program is administered by the U.S. Army Corps of Engineers (ACOE).

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 Water Quality Control Plan for the Tulare Lake Basin (1995). 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. Such discharges are regulated under Title 23, California Code of Regulations, Chapter 9, Division 3. The proposed project will receive a Waste Discharge Requirement from the CVRWQCB for the stormwater runoff pond.

CALIFORNIA DEPARTMENT OF FISH AND GAME STREAMBED ALTERATION PROGRAM

The Department of Fish and Game is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. Section 1600 of the Fish and Game Code requires notification to the Department before beginning a project that may impact a river, stream, or lake. If the Department determines that the project may adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required (CA Dept. of Fish and Game, 2000).

LOCAL

KERN COUNTY CODE OF BUILDING REGULATIONS GRADING CODE

Chapter 17.28 sets forth rules and regulations to control excavation, grading, and earthwork construction, including fills and embankments; establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading construction (Kern County, 2000). The grading required for the project will exceed 2,000 cubic yards; therefore, the Applicant needs to comply with Engineered Grading Requirements under 17.28.070 Grading Permit Requirements.

ENVIRONMENTAL SETTING

SITE DESCRIPTION

The Midway Sunset Cogeneration Company (MSCC) proposes to locate the Western MSCC project on a 10-acre site approximately 40 miles west of Bakersfield, California, to the west, and immediately adjacent to the existing MSCC facility just north of the Midway-Sunset Oil Field. Also proposed is a temporary, 6-acre construction laydown area to the south of the site, adjacent to Crocker Springs Road. The associated transmission line will be located parallel to and within the existing 230 Kv line corridor which will connect the Western MSCC project switchyard and PG&E's Midway Substation near Buttonwillow, California. The water supply line, which will supply water from the West Kern Water District, will be located along an existing right-of-way and on existing pipe supports that extend 1.8 miles to the east of the site (WMSCC 1999a).

The proposed project is located in the Telephone Hills, which are located along the southwestern margin of the San Joaquin Valley in western Kern County. The Telephone Hills are characterized as a series of rounded, smooth sloped hills extending southeastward from the Temblor Range. The elevation ranges from 1,850 to 2,250 feet above mean sea level. These hills are separated by a highly dissected pattern of ephemeral drainages. The San Joaquin Valley lies to the east of the Telephone Hills, while the Midway Valley, which can be considered a subvalley, is also to the east.

Located in a semi-arid region with hot, dry summers, rainfall in the area of the Western MSCC project is approximately between 5.7 inches and 7.95 inches. The Department of Water Resources (DWR) identified the 10 and 50-year recurrences, 24-hour duration storm events for Taft, California to be 1.48 inches and 1.97 inches, respectively. The evaporation rate in the project vicinity is approximately 62 inches per year. Based on average rainfall data, most of the precipitation occurs during the months of October through May (WMSCC, 1999).

The major surface water body within the project area is the Kern River, which is located approximately 16 miles southeast of the proposed Western MSCC site. The California Aqueduct is located approximately 16 miles east of the proposed site. The water district in the vicinity of the Western MSCC site is the West Kern Water District (WKWD).

At the project site, groundwater is encountered at depths greater than 175 feet. The major aquifer in this project area is the Tulare Formation and the older, underlying marine formations. The Tulare Formation, which includes alluvial and non-marine deposits of highly stratified beds of gravel, silt, sand, and clay, is associated with crude oil production. The Tulare Formation is described as consisting of both saturated and unsaturated intervals: the upper Tulare is mostly unsaturated while the lower units are saturated with both oil and water. Whether both intervals are present in the immediate site vicinity is unknown. Groundwater flow in the site vicinity is likely to the east and southeast.

Analysis suggests that the natural groundwater is connate water, that is, water derived at the time of deposition rather than from recharge. Total Dissolved Solids (TDS) levels are in excess of 10,000 mg/l (WMSCC 1999a; 2000a). TDS levels of produced water (water brought up through crude oil and natural gas pumping) are significantly lower than those of the groundwater. MSCC (2000a) estimates that TDS levels from oil production in the adjacent Midway-Sunset Oil Field are approximately one-fourth that of groundwater at the site or approximately 2,500 mg/l.

SOILS

Soils found in the area of each project element are described in Table 1, which also defines the erosion potential of each soil type, slope range, and permeability.

SOIL & WATER RESOURCES Table 1
Soil Descriptions and Properties

Soil Name	% Slope	Erosion Hazard		Permeability	Project Elements
		Water	Wind		
Guijarral Gravelly Sandy Loam	2-9	Moderate	Low	Moderately rapid	Water Supply Pipeline
Kimberlina Fine Sandy Loam[1]	2-5	Moderate	Low	Moderately rapid	Power Plant Site, Construction Laydown, Water Supply Pipeline
Elkhills-Kettleman Association	15-50	Moderate	Moderate	Moderate	Transmission Line
Kettleman-Cochora Association, Moderately Steep	15-30	Moderate	Moderate to High	Moderate	Transmission Line
Olig Association, Steep	30-50	Moderate	Moderate	Moderate	Transmission Line
Welport-Elkhills Association	9-30	Moderate to High	Low to High	Moderate to moderately rapid	Transmission Line
Buttonwillow Clay	0-2	Moderate	Low	Slow	Transmission Line
Elkhills Sandy Loam	9-50	Moderate to High	Low	Moderately rapid	Transmission Line
Elkhills-Torriorthents, Stratified, Complex	9-15	Moderate to High	Low	Moderate to Slow	Transmission Line
Elkhills-Torriorthents, Stratified, Eroded	15-50	Moderate to High	Low	Moderate	Transmission Line
Kettleman Gravelly Loam	15-50	Moderate	Low	Low to Moderate	Transmission Line
Kimberlina Fine Sandy Loam[2]	0-2	Moderate	Low	Slow	Transmission Line
Kimberlina Sandy Loam	2-5	Moderate	Low	Moderate	Transmission Line
Kimberlina Sandy Loam	5-9	Moderate	Low	Moderate	Transmission Line
Lokern Clay	0-2	Moderate	Low	Very low	Transmission Line
Lokern Clay, Saline	0-2	Moderate	Low	Very low	Transmission Line
Panoche Clay Loam	0-2	High	Low	Moderate	Transmission Line
Panoche Clay Loam, Saline-Alkali	0-2	High	Low	Moderately slow	Transmission Line
Torriorthents, Stratified, Eroded-Elkhills Complex[2]	9-50	Moderate to High	Low	Moderately Rapid	Transmission Line

Source: WMSCC, 1999
1 Southwest Kern Soil Survey, USDA, SCS (Unpublished)
2 Soil Survey of Kern County, California, Northwestern Part, USDA, SCS (1988).

FLOOD CONTROL

The project is located between two ephemeral drainages at an approximate elevation of 1,835 feet National Geodetic Vertical Datum (NGVD) of 1929. The drainage channel to the north is located approximately 1,000 feet away from the project site and has a contributing drainage area of about 140 acres as it passes by the site. The ridge between the channel and the project site is 40 to 50 feet above

that channel bed. Therefore, potential flood discharges from that reach will not be a concern to the project site.

Crocker Canyon is located approximately 500 to 600 feet south of the project site. The drainage area contributing to Crocker Canyon as it passes by the site is about 6,900 acres or 10.8 square miles. Channel slopes are 2.5 to 3 percent, which is hydraulically very steep. The channel invert is approximately 30 to 40 feet below the north bank elevations between the project site and the channel. An approximate discharge was calculated using a regional regression equation to determine the flooding potential from the canyon. Due to the high channel invert slopes, the flow depths will be supercritical[1] with depths less than 10 feet and very high velocities of 14 to 15 feet per second. Therefore, the flood stages will be 20 to 30 feet below the project site, including the construction parking and laydown area.

The applicant has indicated that the site is not within the 100-year floodplain of Crocker Canyon. The canyon is subject to flooding approximately one mile downstream from the project.

WATER SUPPLY

WEST KERN WATER DISTRICT

The water supply source for the proposed project is 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, and 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 SWP 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 2**, 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 WKWD demand was 13,239 acre-feet of water. Between 1986 and 1996, the average demand was 13,041 acre-feet of water.

[1] Supercritical flow is a complex term that deals with fluid dynamics. It deals with inertial forces and the and the forces of gravity that act on a flow. Supercritical flow is fast moving, shallow water as opposed to subcritical flow, which is described as deep, slow-moving water.

SOIL & WATER RESOURCES Table 2
West Kern Water District Water Supply (acre-feet)

Year	SWP	Water Purchased	Water Sold	Water In Bank
1990-91	24,348	29,825	10,948	155,488
1991-92	10,464	12,289	14,755	155,408
1992-93	9,496	14,806	12,335	160,137
1993-94	19,523	27,235	12,317	174,484
1994-95	19,838	30,353	11,334	194,956
1995-96	25,000	25,000	13,239	216,503
1996-97	25,000	25,000	13,843	229,133
1997-98	25,000	25,000	13,385	216,556
Total	108,705	139,508	74,928	-
Average	18,118	23,251	12,488	13,165

Source: WKWD 1997

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 SWP 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 SWP both as a contracting entity and through the banking agreement with WKWD. As part of the agreement with WKWD, BVWSD delivers WKWD's SWP 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 SWP water supplied to BVWSD. In addition, WKWD has an historic right to pump an additional 3,000 acre-feet of groundwater per year.

The availability of SWP supplies is variable and subject to cutbacks during drought years. The district attempts each year to obtain the maximum amount of SWP water available and is usually able to bank all of its SWP water through the banking agreement with BVWSD. **SOIL & WATER RESOURCES Table 2** shows the amount of SWP water received, water acquired from other sources, water demand and water banked for water years 1990 through 1998. As of June 1998, WKWD had banked approximately 216,000-acre feet of groundwater. Since 1990, WKWD has banked on average over 12,000-acre feet per year through its agreement with BVWSD. Groundwater is provided for all domestic uses.

WKWD'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. Both districts recharge the basin through the use of spreading ponds and the Kern River Channel near the WKWD's wellfield. Average basin recharge between 1979 and 1996 has been 11,250 acre-feet per year (WKWD 1997). Groundwater levels in the

vicinity of the WKWD's wellfield have varied greatly over the last five years due to changes in production and due to recharge.

The groundwater pumped by the district from their wellfield is typically a sodium bicarbonate water with low levels of Total Dissolved Solids. It generally meets drinking water standards (WKWD 1997).

ENVIRONMENTAL IMPACTS

PROJECT SPECIFIC IMPACTS

EROSION AND SEDIMENTATION

Power Plant Construction and Operation**.** Accelerated wind and water-induced erosion may result from earthmoving activities associated with construction of the proposed project. The San Joaquin Valley, being a semi-arid environment, may encounter storms of short duration and high intensity. Such runoff events coupled with earth disturbing activities can result in increased erosion and sedimentation. Grading activities can affect natural watercourses in two ways: (1) when grading activities occur directly in waterways (linear crossings) and (2) indirectly by redirecting runoff patterns.

As illustrated in **Table 1**, the soil sensitivity related to water and wind erosion ranges from high to low. Soils at the power plant site are slightly susceptible to water erosion and moderately susceptible to wind erosion (WMSCC 1999). Upon removal of vegetative cover and the commencement of earthmoving activities, all soils are highly susceptible to erosion. **Biological Resources Table 2** exhibits land disturbance acreage directly affected by construction and operation of the proposed project.

According to **Table 5.4-3** in the AFC, 55 acres are expected to be disturbed during the construction activities. The initial earthmoving activities at the proposed project site will include topsoil removal and the removal of an existing topsoil stockpile associated with the existing MSCC facility. The power plant site will require cut and fill operations that are necessary to create a level elevation of 1,834 feet above sea level. Approximately 50,000 cubic yards of cut and 44,000 cubic yards of fill are needed to achieve final grade (WMSCC 1999). Due to the cut and fill balance, no soil will need to be imported to the site. Material used for backfill and compaction will be temporarily stockpiled south of the proposed site between West Crocker Springs Road and Crocker Canyon. Excess topsoil will be used to construct a non-structural architectural berm in this area. Some earth disturbance will be necessary for the 6+/- acres construction laydown (staging) area (WMSCC 1999). "The plant site will be leveled, compacted, covered with asphalt and/or aggregate" and drainage, which will be limited to onsite sources due to interceptor channels around the site, will occur from west to east (WMSCC 1999).

Physical erosion related to wind and water may continue to erode unprotected surfaces during project operation. Impervious surfaces can cause increased runoff

that may eventually lead to accelerated erosion in unprotected areas. The Western MSCC project has provided a draft Erosion Control and Stormwater Management Plan that identifies potential temporary and permanent Best Management Practices. This plan and provisions for the final draft are discussed under the proposed mitigation presented below.

Linear Facility Construction and Operation. Minimal temporary and permanent disturbances related to linear facilities are expected to occur. Water will be delivered to the site via a 1.8-mile, 16-inch supply pipeline. The proposed water supply line, which will come from a West Kern Water District line, will join the existing MSCC pipeline corridor. The line will traverse areas previously disturbed via oil field operations with slopes ranging from 2 percent to 9 percent. Soil disturbance is expected to be minimal for the water supply line because the line will be constructed aboveground. All other pipeline services will stem from the existing MSCC, therefore all pipe work will be confined between the existing and proposed facilities (WMSCC 1999).

There will be one 19 mile-long tubular steel tower transmission line associated with the Western MSCC project.[2] The transmission line route is proposed in areas of existing transmission line corridors and access roads. In fact, the proposed route parallels an existing transmission line along its entire length; therefore, no new access roads are needed for the construction and maintenance of the proposed transmission lines. The AFC states that 0.156 acre would be utilized for permanent operation of all the transmission structures to be constructed along the transmission route.

The proposed transmission line will cross the Buena Vista Creek, California Aqueduct, Kern River Flood Canal, Mirasol ditch, and several ephemeral drainages. The water supply pipeline will not disturb any watercourses along its route. All other linear facilities will be confined to the proposed site and the existing MSCC facility.

According to a conversation with the RWQCB (Bennett, 2000), the Kern River Flood Canal, California Aqueduct, and all other drainages labeled as blue-lines on a USGS map are regulated under the Clean Water Act. Construction and operation of the transmission lines will not impact any channel or floodplain; therefore, Section 401 or 404 Permits will not be required (WMSCC 1999).

The transmission line will cross the California Aqueduct, Kern River Flood Channel and several intermittent watercourses. For watercourses affected by transmission line construction, a Streambed Alteration Agreement will be required from the California Department of Fish and Game. Refer to the **Biological Resources** Section for more information regarding the aforementioned requirement.

[2] In 1988, CEC approved an amendment regarding the "Transmission Line Engineering Conditions of Certification Nos. 1b and 4h for the MSCP" (WMSCC 1999). Because of this order, no alternate transmission line is included in the Application for Certification (AFC).

WATER SUPPLY

On an average annual basis, the proposed project will require approximately 3,260-acre feet of water from the WKWD (WMSCC 1999). Western MSCC, however, intends to treat approximately 800-acre feet of cooling tower blowdown from the proposed project and use this water at the existing MSCC power plant. Therefore, new water demand for the proposed project, taking the displacement of 800 acre-feet at the existing facility into account, is approximately 2,460-acre feet per year. The estimate of project estimate is based on an average consumption with an average annual temperature of 65°F and 50 percent relative humidity at a 90 percent capacity factor. Water uses include cooling tower makeup, gas turbine evaporative cooler makeup, boilerfeed water makeup, utility water, potable water, and miscellaneous uses. The WKWD will supply raw water to the Western MSCC project for steam cycle cooling, combustion turbine evaporative cooling, firewater, and miscellaneous utility uses. A new 16" diameter pipeline will be constructed between WKWD's line number 303 and the project site. Three 50 percent capacity pumps will be installed at the tie-in location. The new 1.8-mile water line will follow an existing pipe corridor that was constructed as part of the original MSCC facility. The new water line will be designed to deliver a maximum flow of 3,000 gpm.

Water storage on site will make use of the existing 500,000 gallon MSCC water storage tank. The tank will act as a buffer to be drawn down in the daytime while being filled at night. The cooling tower basin will serve as the firewater reservoir for the Western MSCC plant, thus eliminating the need for a separate firewater storage tank.

With the addition of the Western MSCC project's requirements, the WKWD customer deliveries will increase from approximately 13,000 acre feet to approximately 15,000 acre feet per year. This is considerably less than the District's SWP entitlement of 25,000-acre feet.

Between 1986 and 1996, WKWD received on average 19,587 acre feet of SWP 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). New increases in water supply for WKWD include the La Paloma Generating Project (La Paloma), the Sunrise Cogeneration Project, and the Elk Hills Power Project (EHPP). Recently the Energy Commission approved the La Paloma Project that will also be receiving water service from WKWD. Once operational, La Paloma will require 5,500-acre feet of water annually. The district will provide this water to La Paloma through a dedicated diversion in the California Aqueduct. The EHPP will have a water requirement of approximately 3,179-acre feet, which will be met by WKWD from its groundwater storage rights in the Tupman area. The Sunrise Project will require an estimated 278-acre feet per year of water from WKWD. Providing water to these facilities will represent an increase of approximately 78 percent in the district's water demand.

Water demand in the 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 (WKWD 1997).

Currently, WKWD has approximately 216,000-acre feet of water banked. Given the district's entitlement to SWP water and the amount of banked groundwater, the supply of water to Western MSCC project will neither adversely effect the district's ability to supply its existing customers nor curtail the district's ability to meet future demand.

WATER QUALITY

Incorrect disposal of wastewater or inadvertent chemical spills can degrade soil, surface water and groundwater. The Western MSCC facility plans to dispose sanitary waste to a septic system and leachfield. Cooling tower blowdown, heat recovery steam generator (HRSG) boiler blowdown, combustion turbine evaporative cooler blowdown and non-restricted process reject waters will be used in the existing MSCC plant. The waste streams from Western MSCC facility will be routed to the Aera Energy Victory Water Treatment Plant and replace fresh and/or other boiler feedwater. The Victory Water Plant is located less than 1 mile east of the Western MSCC site. The water will be filtered and softened and returned to the existing MSCC facility as boiler feedwater to its HRSGs. Since these wastewater streams will be treated and reclaimed for use in the existing MSCC plant there are no wastewaster effluent streams.

Washdown water will be collected and sent to a new oily water separator prior to discharge to the storm retention basin.

Soil & Water Resources Table 3
Wastewater Discharges

Waste Stream	Average (gpm)	Peak (gpm)
Cooling Tower Blowdown	368	537
HRSG Blowdown	13	14
Evaporative Cooler Blowdown	6	21
Inlet filter Backwash	76	84
Discharge to Retention Basin	0.7	n/a
Misc. Utility Water to Ret. Basin	0.5	0.5
GT offline water wash (gal/yr)	<100,000	n/a

Source: WMSCC DR54

Opportunities may exist to reduce fresh water consumption through the reduction of the amount of water required for cooling water makeup. This may be achieved by increasing the number of cooling water cycles above the proposed five cycles. An analysis (WMSCC 2000z) was performed to assess the feasibility of increasing the cycles of concentration from five to ten. To achieve the higher number of cycles the water supply must be treated to reduce iron and silica. While this is technically

feasible, the resulting higher concentration levels of blowdown from the cooling tower would prohibit the ability to reclaim the water for use at MSCC. When taking into consideration that the proposed Western MSCC project water is being reclaimed and reused at the existing MSCC plant , the net wastewater discharge would increase from 2.8 acre feet/year to 416 acre feet per year. This larger volume of wastewater can no longer be handled by evaporation and percolation in the on-site storm water retention basin. Therefore, the wastewater would require a system of injection wells, a pumping station and a pipeline. It has been estimated that the cost of these facilities would be approximately $4,000,000. When combined with the cost of the additional treatment facilities for the supply water the total capital cost increase for going from 5 to 10 cycles of concentration would be $5,400,000.

CUMULATIVE IMPACTS

Temporary and permanent activities associated with the construction and operation may cause accelerated wind and water erosion. Implementation of the proposed mitigation measures would ensure that erosion and potential sedimentation resulting from the proposed Western MSCC project is minimized.

The WKWD has sufficient SWP entitlement and banked groundwater supply to meet the water demand for the life of the project. As noted above, the recently approved La Paloma project will use approximately 5,500-acre feet of WKWD's SWP water demand per year. La Paloma has recently submitted an amendment to the Energy Commission regarding increasing water demand approximately an additional 500-acre feet per year. This water will be directly diverted from the California canal. 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 proposes to use banked groundwater in the amount of 3,179-acre feet per year. The Sunrise Cogeneration and Power Project (98-AFC-4) proposes to use approximately 278-acre feet of water per year from the district with other water demand from this project being met by using produced water from the oil field. These projects, in conjunction with existing demand, represent approximately 23,000-acre feet of water demand per year, the majority of the district's annual allocation of SWP water, assuming full delivery.

The district feels that there will not be increases in water demand from other customers (Patrick 1999). In addition, given the district's large banked groundwater supply and the flexibility to buy water from other sources, these new projects shall not adversely affect the district or its other customers.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

EROSION AND SEDIMENTATION

> In response to a staff data request, MSCC provided a rough-draft Erosion Control and Stormwater Management Plan that identifies temporary and permanent erosion control and stormwater Best Management Practices (BMPs). When finalized, this plan will serve as the Storm Water Pollution Prevention Plan (SWPPP) as required under the General Construction NPDES Permit issued by the State WRCB. The erosion control BMPs can also be implemented into the Kern County Grading Code permit requirements.

The rough-draft plan identified a number of potential BMPs for the construction and operation of the project.

BEST MANAGEMENT PRACTICES THAT REDUCE EROSION AND SEDIMENT-LADEN STORMWATER RUNOFF

- Mulching on disturbed soils or 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 (i.e. water) as appropriate and as required in Air Permit Conditions
- Utilize straw bale barriers to intercept sediment-laden runoff from small areas of disturbed soil
- Install straw check dams to reduce erosion of existing drainage channels and to promote sedimentation behind the dam
- Install silt fencing to promote sedimentation behind silt fence
- Storm water retention basins to retain runoff and allow excessive sediment to settle out
- Decreasing the effects of wind erosion on disturbed soil by mulching soil stockpiles, limited exposed areas, and applying water or other dust suppressors to disturbed roads

BEST MANAGEMENT PRACTICES THAT PREVENT STORMWATER CONTAMINATION

- Secondary containment for hazardous material delivery and storage areas to prevent spills or leakage of liquid materials from contaminating soil or soaking into the ground

- Covered dumpsters and containers for waste
- Designated storage areas for construction wastes
- Proper storage of hazardous materials, paints, and related products
- Training of employees on the proper use of materials such as fuel, oil, asphalt, concrete compounds, acids, glues, paints, solvents, etc.
- Implementation of a spill prevention and control plan
- Timely removal of construction wastes
- Storage of all liquid wastes in covered containers
- Use of portable toilet facilities managed by licensed contractor

SITE DRAINAGE

The applicant has proposed to construct a retention basin to handle rainfall runoff from 10.7 acres onsite and 14.4 acres off site for a total of 25.5 acres. The applicant submitted a response, dated June 28, 2000, providing additional information regarding the sizing of the retention basin. The response indicated that the proposal basin would "adequately satisfy the development standards of the County of Kern." A review of that submittal and the County development standards (Chapter VIII – Section 408) indicated the following:

1. Sizing the retention basin should be based on the Intermediate Storm Design Discharge (ISDD) resulting from the runoff from a 5-day storm event determined using a 10-year depth of rainfall, an average percentage of impervious area, and the drainage area for the total development. With a 10-year rainfall of 2.85 inches, and using average impervious percentages of 90 percent and 25 percent for drainage areas of 10.7 acres and 14.4 acres, respectively, the calculated design volume is 4.52 acre-feet.

2. If the proposed percolation rate of 4 inches per day were used with the average percolation area of 29,300 feet^2 (.67 acres), the time to completely drain 4.52 acre-feet is 20.5 days. This is significantly greater than the 7 days allowed in Section 408-8.01.

3. If the proposed percolation rate of 4 inches per day were used with the design runoff volume of 4.52 acre-feet, an average percolation area of 1.95 acres would be required. This would result in an average depth of approximately 2.3 feet.

4. If the proposed basin and percolation area were used, a percolation rate of 11.6 inches per day would be required to completely drain the design volume in 7 days. This would result in an average percolation depth of about 6.7 feet.

5. The key variable is the percolation rate of the materials below the basin. The testing by a Soils Engineer, required in Section 408-8.02, to establish a soil drainage rate keyed to the site is essential to sizing the basin.

6. Based on the sketches and details shown on the application and in the June 28, 2000 response, it appears that the design volume may not be entirely contained within the cut as required by Section 408-7.01.

7. Additional requirements such as containment of the 100-year, 24-hour storm with 2 feet of freeboard should be tested after meeting the requirements in the County development standards.

WATER SUPPLY

No mitigation measures have been proposed for water supply impacts.

WATER QUALITY

Mitigation measures identified by Western MSCC project (1999a) to protect water quality are those specifically addressing erosion, sedimentation and stormwater control measures identified above. WMSCC (1999a) has provided a description for the handling and storage of aqueous ammonia including design information and containment criteria. However, no specific information has been provided to assess the acceptability of spill prevention measures for other plant chemicals.

STAFF PROPOSED MITIGATION MEASURES

In general, staff proposed mitigation measures are augment Western MSCC's measures, to ensure proper implementation of the measures and to ensure compliance with applicable laws, ordinances and standards.

For site drainage, staff identified a number of points where retention pond design needs clarification. Proposed Condition of Certification Soils & Water 1 addresses this and other stormwater runoff issues as well as the need for Western MSCC project to identify chemicals and areas of potential spill exposure and explain design and measures for storage, handling, containment, and possible cleanup. A contingency plan should be developed for chemical spill control and management. Most of the subsequent proposed Conditions of Certification are to ensure proper implementation of erosion and stormwater runoff control measures. Proposed Condition of Certification Soil & Water 5 address compliance with the Waste Discharge Requirements to be issued by the CVRWQCB.

FACILITY CLOSURE

A planned, unexpected temporary or permanent closure of the proposed project should not be a significant concern if site drainage, especially the retention basin and erosion are properly dealt with for any potential closure. The Central Valley Regional Water Quality Control Board will impose closure requirements for the retention basin as part of the Waste Discharge Requirement. Unexpected permanent closure may pose the potential for erosion and other portions of the drainage system due to a lack of maintenance of the facilities. Staff will require Western MSCC project to address this concern in their closure plan.

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES AND STANDARDS

STATE WATER RESOURCE CONTROL BOARD POLICY ON INLAND SOURCES OF COOLING WATER

The State Water Resources Control Board (SWRCB) adopted the Water Quality Control Plan for Inland Sources of Cooling Water (Order 75-58) to address the need to consider alternatives to the use of fresh inland water for power plant cooling purposes and the discharge of cooling tower blowdown to unlined pits. This policy, adopted in 1975, 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 returns flows
4. Inland wastewaters of low total dissolved solids.
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 brackish, natural water pumped up with oil is a potential water source that could be used for project cooling. WMSCC (1999a; 2000h) investigated the availability of produced water to be used for the project; however; all of the water is currently being recycled by oil companies for use in thermally enhanced oil recovery operations. Groundwater in the area was rejected due to the high levels of total dissolved solids it contains, in excess of 10,000 mg/l, making it unfeasible for use in evaporative cooling towers without significant treatment. The use of water from the Buena Vista Water Storage District or the Kern County Water Authority provide no advantages over using water from WKWD and does not address the intent of SWRCB Policy 75-58. The only potential alternative is using brackish groundwater. Use of this water source does raise potentially significant economic and environmental concerns. A greater volume of brackish water will be required by the project because of the high total dissolved content level of this water, therefore, this water can be cycled fewer times than fresh water from WKWD can. Also use of this water supply will require additional water treatment and higher capital and operation and maintenance costs. Since the policy only addresses sources of cooling water, it is anticipated that Western MSCC project would want to use water from WKWD for the steam cycle, because of the need for higher quality water in these processes. Therefore, the proposed source water pipeline from WKWD's facility would still be required.

Environmental costs from use of this source would deal mainly with impacts on groundwater resources from pumping, interference with other wells and impacts with disposal of additional waste water from higher blowdown from the cooling

tower. Staff's approach to this policy, consistent with recent Energy Commission decisions on the High Desert Power Project (97-AFC-1) and the La Paloma Power Project (97-AFC-2), is that the policy is guidance in that alternative sources of cooling water or cooling technology must be considered but does not represent a prohibition on the use of fresh inland water even if alternative sources are available.

The State Water Resources Control Board (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 the project is proposing to use of water already in the WKWD entitlement which has historically been withdrawn by WKWD and does not represent a new withdraw from the SWP it should not reduce the amount of water available for Delta outflow.

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 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 upon the 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.

Soil & Water Resources Table 4
Cooling Technology Comparison

	WET	***WET/DRY***	***DRY***
Estimated Capital Cost ($M)	$21,484	$47,897	$53,517
Avg. Cooling Tower Makeup Rate (gpm)	1,844	961	0
Annual CT Makeup Cost ($M)	$2,104	$1,097	0
Auxiliary Power Consumption (kW)	13,901	13,989	16,340
STG Gross Power Output (kW)	159,988	151,006	151,006
Net Plant Output (kW)	453,336	445,267	442,915
Net Power Differential (kW)	Base	(8,069)	(10,421)
Annual Revenue Loss ($M)	Base	$2,545	$3,286
Net Plant Heat Rate (LHV) (Btu/kWh)	6,290	6,404	6,438

Source WMSCC DR 54

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 dependent upon 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. The applicant evaluated the capital costs, cooling tower makeup rate and cost, auxiliary power consumption and cost, and the net plant output and heat rate for wet, wet/dry, and dry cooling tower options. Assuming a 90 percent capacity factor the table above shows the results of this evaluation. The applicant evaluated the capital costs, cooling tower makeup rate and cost, auxiliary power consumption and cost, and the net plant output and heat rate for wet, wet/dry, and dry cooling tower options. Assuming a 90 percent capacity factor the following table shows the results of this evaluation.

When compared to the wet cooling towers the alternatives of using a dry or wet/dry cooling system of would save on average 1,844 or 961 gpm respectively. However, there would be a corresponding estimated capital cost increase of $32,033,000 for the dry alternative and $26,413,000 for the wet/dry hybrid alternative. Additionally, there would be an estimated annual electric revenue decrease of $3,286,000 using the dry cooling alternative and $2,545,000 using the wet/dry alternative. Plant performance also suffers by a decrease in capacity of 10,421 kW and increase in

heat rate of 148 Btu/kWh for the dry alternative and 8,069 kW and 114 Btu/kWh for the wet/dry alternative.

Environmental impacts of the alternate cooling methods were also considered by Western MSCC (1999a; 2000h) for particulate emissions, visible plume, land use, and noise levels. Particulate emission comparisons (PM_{10}) are 0.235 lb/hr (1.03 tpy) for the wet alternative, 0.128 lb/hr (0.56 tpy) for the wet/dry alternative, and 0 lb/hr for the dry alternative. These values translate to a maximum annual impact of 1.2 μgm^3 for the wet cooling tower and 0.5 μgm^3 for the wet/dry-cooling tower. These values compare to a background particulate concentration in the area of 31.7 μgm^3.

Land use analysis indicate that for the three cooling alternatives the wet cooling tower would require 10.0 acres and have a maximum height of 41 feet, the wet/dry cooling tower would require 12.0 acres with a maximum height of 95 feet and the dry alternative would require 12.6 acres with a maximum height of 106 feet. Noise levels for the three alternatives are all 85 dBA for near field @ 3 feet and 78 dBA @ 50 feet for the wet cooling tower, 62 dBA @ 400 feet for the wet/dry cooling tower and 65 dBA @ 400 feet for the dry alternative.

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.

Use of dry cooling or wet/dry cooling technology is technologically feasible and would reduce water demand but would have significant additional capital and operation and maintenance costs. A wet/dry cooling system would still require a significant water supply at least a portion of the year and would therefore include the additional economic and environmental costs of such a supply. None of the environmental impacts from any of the cooling tower alternatives are considered to be significant.

Western WSCC project filed a Report of Waste Discharge (1999a; 2000h) for the retention basin. The Central Valley Regional Water Quality Control Board (CVRWQCB 2000a) originally found the Report inadequate, but after Western MSCC (2000z; WZI 2000c,d) submitted the necessary information, the Report of Waste Discharge (application) was deemed complete by the Regional Board (Patterson 2000). A draft Waste Discharge Requirement (permit), however, will not be available for staff to review until late November (Patterson 2000). Staff anticipates that this draft federal permit will be available prior to the evidentiary hearing, and will be granted in any case. (see proposed condition 5)

Although a draft Waste Discharge Requirement is needed, Staff anticipates that the proposed project will comply with all other applicable laws, ordinances and standards.

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes that the proposed project will not cause a project specific significant impact nor contribute to a significant cumulative impact to soil and water resources. Staff anticipates that the proposed project will comply with all applicable laws, ordinances and standards, including the Waste Discharge Requirement from the Central Valley Regional Water Quality Board for the retention basin, as specified in proposed Soil & Water Condition 5. Staff recommends certification subject to the following conditions.

CONDITIONS OF CERTIFICATION

SOILS & WATER-1: Prior to ground disturbance, the project owner shall develop and implement Storm-water Pollution Prevention Plan (SWPPP). The project owner shall identify chemicals and areas of potential spill exposure and explain Best Management Practices for storage, handling, containment, and possible cleanup. A contingency plan shall be developed along with a qualified contact for spill control and management.

Verification: Thirty days prior to the start of any ground disturbance, the project owner shall submit a copy of the SWPPP to the Energy Commission Compliance Project Manager (CPM) for review and approval. No ground disturbance may commence until the SWPPP has been approved by the CPM.

SOILS & WATER-2: Prior to beginning ground disturbance the project owner shall submit an Erosion and Sediment (E&S) Control and Re-vegetation Plan for CPM approval. The plan shall contain all the elements of the draft plan plus all changes recommended by the CPM.

Verification: Thirty days prior to any ground disturbance, the project owner shall submit for approval an Erosion Control and Re-vegetation Plan to the CPM.

SOIL&WATER 3: Prior to any ground disturbance, the project owner shall obtain a grading permit from the Kern County Building Department.

Verification: Thirty days prior to any ground disturbance, the project owner shall submit for approval, one set of plans/specifications and other supporting data specified in the Engineered Grading Requirements of the Kern County Grading Code to the CPM. Upon CPM approval, the project owner shall submit a building permit application and required plans to the Kern County Building Department.

SOIL&WATER 4: Prior to commercial operation, the project owner shall develop and implement a SWPPP to control storm-water runoff to comply with the requirements of the General Storm-water NPDES Permit for Industrial Activities.

Verification: Thirty days prior to commercial operation, the project owner shall submit to the CPM for approval, a SWPPP that addresses the control of storm-water runoff during project operation. The project owner shall implement the approved SWPPP.

SOIL&WATER 5: The project owner shall obtain the Waste Discharge Requirements from the Central Valley Regional Water Quality Control Board for the retention pond prior to operation of Western MSCC project. The project owner shall comply with all provisions of the Waste Discharge Requirement. The project owner shall notify the CPM of any proposed changes to this permit, including any application for permit renewal.

Verification: Within 30 days following receipt of the Waste Discharge Requirement from the Central Valley Regional Water Quality Control Board, the project owner shall submit a copy of the permit to the CPM. The project owner shall submit to the CPM in the Annual Compliance Report, a copy of the Annual Monitoring Report submitted to the Central Valley Regional Water Quality Control Board. The project owner shall notify the CPM in writing of any changes to and/or renewal of this permit.

REFERENCES

Bennett, Jarma (Regional Water Quality Control Board). 2000. Telephone conversation with Joe Crea, Aspen Environmental Group. July 31.

California State Water Resources Control Board. 2000. Construction Activities Stormwater General Permit (www.swrcb.ca.gov/stormwtr/construction.htm). July 2000.

County of Kern. 2000. Kern County Grading Code Chapter 17.28 (www.co.kern.ca.us/ess/Kcregs.htm). July 2000.

California Department of Fish and Game. 2000. Streambed Alteration Program (www.dfg.ca.gov/1600/1600.html). July 2000.

CRWQCB (California Regional Water Quality Board/Pa). 2000a. Report of Waste Discharge. Submitted to the California Energy Commission/Dockets Unit on July 7, 2000.

International Erosion Control Association. 1995. Practical Approaches for Effective Erosion and Sediment Control.

Patterson, Doug. 2000. Senior Sanitary Engineer. Central Valley Regional Water Quality Control Board. Personal communication with Joe O'Hagan, California energy Commission. Various.

Western Midway Sunset Cogeneration Company (WMSCC). 1999a. Application for Certification, Western Midway Sunset Cogeneration Project (99-AFC-9). Submitted to the California Energy Commission, December 22, 1999.

Western Midway Sunset Company (WMSCC). 2000a1. Report of Waste Discharge Western Midway Sunset Cogeneration Company Facility Midway Sunset Oil Field Section 17, T31S., R22E., M.D.B. & M. Kern County California. Submitted to the California Energy Commission/Dockets Unit on July 25, 2000.

Western Midway Sunset Cogeneration Company. (WMSCC). 2000h. Western Midway Sunset Cogeneration Company Application for Certification – Supplemental Material. Submitted to the Agency list on February 22, 2000.

Western Midway Sunset Cogeneration Company. (WMSCC). 2000s Data Request Responses 1-53. Submitted to California Energy Commission/Dockets on May 5, 2000.

Western Midway Sunset Company (WMSCC). 2000z. Supplementary AFC Material in Response to Data Requests 4. Submitted to the California Energy Commission/Dockets Unit on July 11, 2000.

Patterson, Doug. 2000. Central Valley Regional Water Quality Control Board. Personal communication with Joe O'Hagan, California Energy Commission. August 3, 2000.

U.S. Department of Agriculture, Soil Conservation Service (SCS) (NRCS). 1988. Soil Survey of Kern County, California, Northwestern Part.

WZI . 2000c. Completion of Application for a Report of Waste Discharge Attachments A-C, Figures 1,-2, Tables 1-2 Zalco Laboratories, INC. Analytical And Consulting Services Report of Analytical Results. Submitted to the California Energy Commission/Docket Unit on July 25, 2000.

WZI (WZI/M. J. Wilson). 2000d. Report of Waste Discharge application for the Western Midway Sunset Cogeneration Company Project. Submitted to the California Energy Commission/Dockets Unit on July 25, 2000.

GEOLOGY AND PALEONTOLOGY

Testimony of Robert Anderson

INTRODUCTION

The geology and paleontology section discusses the project's potential impacts regarding geological hazards, geological and paleontological resources, and surface water hydrology. The purpose of the geology analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and 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. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources, and surface water hydrology during project construction, operation and closure. The section concludes with the staff's proposed monitoring and mitigation measures with respect to geological hazards, geological and paleontological resources, and surface water hydrology, with the inclusion of ten conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicable LORS are listed in the AFC, in Sections 5.3, 5.5, and 5.8, (Midway 1999a). A brief description of the LORS for geological hazards and resources, surface water hydrology and paleontological resources follows:

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control other than the requirement by the Bureau of Land Management (BLM) for an excavation permit for excavations and grading. Since the proposed water line route and the electric transmission line corridor cross lands under the jurisdiction of the federal government (BLM), both the Federal Land Planning Management Act and the National Environmental Policy Act apply to the management of paleontological resources on the lands under the jurisdiction of the BLM.

STATE AND LOCAL

The California Building Code (CBC) 1998 edition is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in the investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33). The CBC supplements the UBC's grading and construction ordinances and regulations.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (SVP 1994) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists).

SETTING

The proposed Western Midway Sunset Cogeneration Company Project (Western MSCC) expansion is located along the eastern flank of the Tremblor range and on the north side of a roadway paralleling Crocker Canyon in the western portion of the Midway-Sunset oil field in western Kern County. There are two geologic units exposed in the vicinity of the footprint for the power plant expansion: the Tulare formation and older alluvium.

The older alluvium is Pleistocene in age and is made up of silty sands and gravels and drains well. The Tulare Formation is a Quaternary age alluvial fan deposit made up of poorly consolidated sands and gravels with silt lenses. The Tulare formation is known to contain vertebrate fossils in the vicinity of the proposed power plant expansion project. Locally the Tulare Formation unconformably overlies the Santa Margarita Formation and the Monterey Formation.

The linear corridor proposed to service the site crosses several additional geologic units, namely: the Monterey Formation, the Santa Margarita Formation, the Etchegoin Formation, the Belridge Diatomite, alluvial fan deposits and alluvium. The alluvial fans and alluvium are derived from the weathering of older geologic units such as the Monterey Formation, and the Tulare Formation. These units are mainly made up of unconsolidated sand, silts, and may contain local deposits of gravel. Etchegoin Formation is a Pliocene age marine unit made up of soils and sands. Both the alluvial fan deposits and the alluvium may contain terrestrial fossils. The Miocene age Monterey Formation consists of shale, siltstone, sandstone and conglomerate. Locally the Monterey Formation contains commercial quantities of oil. The main oil producing unit of the Monterey Formation at the proposed site location is the Potter Sand member. The Potter Sand member of the Monterey Formation does not outcrop in the vicinity of the project. Locally the Monterey Formation and the Santa Margarita Formations interfinger with one another. The Santa Margarita Formation is Miocene in age, and is made up of marine sands and

nonmarine sands, and gravels. Both terrestrial and marine vertebrate fossils have been reported in this unit.

No permanent surface water bodies are located on or adjacent to the power plant footprint. However, there is a minor unnamed ephemeral drainage that runs through the site from the west and north to the east, into a storm water retention basin. The proposed 10-acre power plant expansion footprint is to be a transition pad with an elevation of 1834 feet above mean sea level.

ANALYSIS AND IMPACTS

GEOLOGICAL HAZARDS

FAULTING AND SEISMICITY

The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the California Building Code. Energy Commission staff reviewed the California Division of Mines and Geology publication "Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions," dated 1994 (CDMG 1994) and aerial photos of the proposed power plant footprint. Energy Commission staff visited the proposed power plant location on February 18, 2000, and did not observe any surface faulting at the proposed power plant site on the ground or in aerial photos. No active faults are known to cross the proposed power plant footprint. Several faults cross the proposed linear corridors. However, a minor fault was observed in the drainage (Crocker Canyon) to the south of the proposed power plant footprint. This unnamed fault is the closest known fault to the power plant footprint and is located approximately 200 meters south of the proposed power plant. The applicant had the fault assessed when the original power plant was being licensed. Trenching by the applicant's consultant in 1986, north of Crocker Canyon did not indicate that the fault continued to the location of the proposed power plant expansion.

The next closest known fault to the power plant expansion site is the Telephone Hills fault located approximately 1.1 kilometers east of the site. The electric transmission line crosses both the Midway-McKittrick and the Dabney Faults and several unnamed faults north of the Midway-McKittrick Fault. Linear facility route no. 2 is crossed by two minor unnamed faults between mileposts 1 and 2. None of the faults are considered active. Since the faults are not considered active and they are small, they are not considered to be significant with respect to the project construction and operation.

The nearest major active fault is the Carrizo Plain segment of the San Andreas Fault. The San Andreas Fault is located approximately 10 kilometers west of the site. The maximum credible earthquake estimated for the San Andreas Fault in the vicinity of the site is a moment magnitude 7.9 earthquake. The estimated peak horizontal ground acceleration at this site based upon the aforementioned earthquake is 0.5g. Several other faults are located within 100 kilometers of the

site, but the design event earthquake using a deterministic approach is the moment magnitude 7.9 earthquake on the Carrizo Plain segment of the San Andreas fault.

LIQUEFACTION, HYDROCOMPACTION, SUBSIDENCE, AND EXPANSIVE SOILS

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. One of the parameters used to assess the potential for liquefaction is the depth to ground water at the site under study. Generally the depth to ground water at a site should be less than 50 feet for liquefaction to be possible. The depth to groundwater beneath the site is estimated to be in excess of 100 feet below existing grade based on soil boring logs for the project. Because the alluvium under the site is dense and the depth to ground water is in excess of 100 feet below existing grade, the potential for liquefaction at the power plant site is considered to be negligible.

Hydrocompaction is the process of the loss of soil volume upon the application of water. During the construction of the existing Western Midway Power Plant the owner excavated the footprint to a depth of 14 feet and replaced and compacted and moisture conditioned the fill in order to mitigate the potential of collapsing soils at the site. The site has been in service for fourteen years and has not experienced any significant collapsing soils. The applicant is aware of the potential of collapsing soils and has indicated that they will assess the power plant footprint and linear facilities with respect to collapsing soils prior to developing the final design of the project.

Since the project site alluvium and Tulare Formation soils are locally dense at the site, and the applicant is not proposing to pump ground water, staff have determined that there is no significant potential for subsidence due to ground water withdrawal or dynamic compaction at the proposed power plant footprint.

Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have a high clay content and the clay must have a high shrink-swell potential and a high plasticity index. The soil unit at the proposed power plant expansion site is the Kimberlina Fine Sandy Loam. This soil has a low shrink-swell potential. Since the soil has a low shrink-swell potential, the potential for expansive soil at the site is negligible.

LANDSLIDES

No landslides were observed on or adjacent to the proposed power plant footprint during a staff site visit on February 18, 2000. Landsliding potential at the proposed power plant site is considered to be low, since the proposed power plant is located on a broad, gently to moderately sloping alluvial fan.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

The proposed power plant expansion is located in a major oil field. Other geological resources in the vicinity of the project include natural gas. Directional drilling allows

the extraction of oil and natural gas from the vicinity of the site without having to drill for oil at the site itself.

The State of California Department of Conservation Division of Oil and Gas and Geothermal Resources (DOGGR) requires that a setback from existing oil wells be maintained so that the wells may be serviced. Energy Commission staff have proposed Condition of Certification **GEO-3** to allow the project owner to develop a linear facility development plan that will ensure that will ensure that construction of the power plant and linear facilities will not pose a problem in servicing existing oil wells.

Regarding paleontological resources, Energy Commission staff has reviewed the paleontological resources assessments, Appendix N to the AFC (Midway 1999a). Geology at the power plant footprint and the transmission line location is made up of quaternary alluvium, the Tulare Formation, the Monterey Formation, the Santa Margarita Formation, the Belridge Diatomite, and the Etchegoin Formation. During the construction of the existing power plant, paleontological resources were encountered. The applicant has indicated that the alluvium, the older alluvium, the Tulare Formation, the Etchegoin Formation, the Monterey Formation, and the Santa Margarita Formation have been reported to yield vertebrate fossils. These geologic units are considered to have a high paleontological significance and a high paleontological sensitivity. The close proximity of the paleontological resource locations to the project marks this formation with a high sensitivity and high potential with respect to paleontological resources.

The alluvium in the McKittrick Valley is known to locally contain tar seeps, which have contained well preserved vertebrate Quaternary age fossils. The geologic map for the project does not identify any tar seeps along the linear facility corridor from the power plant to the Buttonwillow substation. However, it is possible that tar seeps may be encountered during the construction of the linear facility corridor. The Belridge Diatomite is considered to have a low paleontological potential and a low paleontological significance. No fossils were observed by Energy Commission staff at the power plant during a site visit on February 18, 2000. No significant paleontological resources were reported found by the applicant's paleontologist during field surveys of the proposed power plant site and linear facilities. Energy Commission staff have proposed conditions of certification that will enable the applicant to mitigate impacts upon paleontological resources to a less than significant level should they be encountered during construction, operation, and closure of the project.

SURFACE WATER HYDROLOGY

The power plant footprint is not located in a 100 year flood zone as it is located in zone "C," an area of minimal flooding as depicted on the Federal Emergency Management Agency Flood Insurance Rate Map sheet no. 060075-1200 B, panel 1200. Minimum grade for the power plant area will be 1 per cent and all drainage will be directed away from buildings within the footprint. Surface water drainage from the low hill to the west of the site will be directed around the site to the northern or southern ephemeral stream channels adjacent to the site. Surface water

will be collected in an on-site detention basin and evaporated. The 10-year 24-hour storm event precipitation amount is 2.5 inches (NOAA 1973). Run-off during a 10-year 24-hour storm event should not overwhelm the capacity of the proposed surface water drainage system.

SITE SPECIFIC IMPACTS

Energy Commission staff considers that there is a moderate to high probability that vertebrate fossils will be encountered during construction of the power plant and related linear facilities. This assessment is based upon the discovery of a large number of fossils, both vertebrate and invertebrate, during the construction of the original Midway-Sunset power plant next to the proposed power plant expansion. However, excavations, drilling, clearing and brushing operations, and grading of alluvium and/or Tulare Formation at the power plant site and related linear facilities associated with construction of the project are considered to be a minor potential impact to paleontological resources, if the applicant complies with the proposed conditions of certification for paleontological resources. The adoption and implementation of the proposed conditions of certifications for paleontological resources should mitigate any potential impacts to paleontological resources associated with the construction of this project.

The site is located in a major oil field. No permanent major surface water bodies are located at the proposed power plant site. Crossing of local drainages by proposed linear facilities are proposed to present a minimum impact on surface water resources. Storm water run-off is proposed to be managed through the proposed power plant's drainage control plan and by complying with the proposed conditions of certification for the **Soil and Water Resources** section of this document. None of the geological hazards identified by the applicant or by Energy Commission staff are considered to be significantly impacted by the construction and operation of the proposed project. In conclusion, the project is not likely to have any significant impact on geological or paleontological resources, or surface water resources, and is likely to withstand the above-described geological hazards.

CUMULATIVE IMPACTS

It is staff's opinion that the potential for a significant adverse cumulative impact on paleontological resources, geological resources, or surface water hydrology is unlikely, if the Western MSCC project is constructed according to the proposed Conditions of Certification. This opinion is based on the fact that the site is not known to have significant paleontological or geological resources.

FACILITY CLOSURE

A definition and general approach to closure is presented in the **General Conditions** section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed

in the construction of the plant. Surface water hydrology impacts will depend upon the closure activities proposed.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

No comments were received regarding geological hazards, resources, paleontological resources, or surface water hydrology from the public or other agencies.

MITIGATION

Based upon the literature and archives search, field surveys and the preliminary geotechnical investigation for the project, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the power plant, related natural gas supply line, electrical transmission line, and the waste water pipelines. The proposed conditions of certification are to allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme that will ensure LORS applicable to geological hazards, geological and paleontological resources, and surface water hydrology for the project are complied with.

CONCLUSION AND RECOMMENDATIONS

The applicant will likely be able to comply with applicable LORS. The project should have no adverse impact with respect to geological and paleontological resources and surface water hydrology. Staff proposes to ensure compliance with applicable LORS for geological hazards, geological and paleontological resources and surface water hydrology with the adoption of the proposed conditions of certification listed below, and the conditions of certification for surface water hydrology which are located in the **Soil and Water Resources** section of this document.

PROPOSED CONDITIONS OF CERTIFICATION

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 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the Compliance Project Manager (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 Chief Building Official (CBO)) prior to the start of construction, the project owner shall submit to the CPM for approval the name(s) and license number(s) of the Certified Engineering Geologist(s) assigned to the project. The submittal should include a statement that CPM approval is required.

The CPM will approve or disapprove of the Engineering Geologist(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the Engineering Geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will approve or disapprove of the Engineering Geologist(s) and will notify the project owner of the findings within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist(s) 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 Engineering Geology Report.

Protocol: The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, 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 of the site for the intended use as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her 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 Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CBO, and to the CPM on request.

GEO-3 Prior to the start of construction, the owner shall submit to the Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) for review and comment, a linear facility development plan. This plan shall

describe the routing of the linear facilities, and address all actions to be taken by the project owner to ensure that the project linear facilities will not interfere with the operation, maintenance, or abandonment of any existing oil or natural gas wells.

Verification: At least sixty days prior to the start of construction, the project owner shall submit to the CPM the linear facility development plan, accompanied by a copy of DOGGR's comments on the linear facility development plan, for the CPM's review and approval.

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 Resource Specialist (DPRS) approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The DPRS shall be responsible for implementing all the paleontological 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 DPRS.

The statement of qualifications for the DPRS shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; and 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.

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.

If the CPM determines that the qualifications of the Proposed Paleontological Resource Specialist (PPRS) do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, DPRS is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource 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 DPRS.

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 sixty (60) days prior to the start of construction, the project owner shall submit the name and resume and the availability for its DPRS, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a DPRS, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new DPRS. 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 DPRS shall prepare a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) 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 PRMMP, as needed, throughout project construction.

Protocol: Protocol: In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994) the owner is also to adopt and implement the United States Bureau of Land Management's General Procedural Guidance Manual for Paleontological Resource Management for those portions of the project deemed by the BLM to be under their jurisdiction. The owner shall develop a PRMMP that shall include, but not be limited to, the following elements and measures:

- 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;

- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;

- 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;

- an explanation that the DPRS 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;

- 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;

- 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; and

- 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 forty-five (45) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the PRMMP prepared by the designated paleontological resource specialist for review and approval. The PRMMP shall include a copy of the BLM paleontological resources use permit for the project. If the plan is not approved, the project owner, the DPRS, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the DPRS shall prepare and conduct 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.

The paleontological training program shall discuss the potential to encounter paleontological 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 DPRS 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 (30) thirty days prior to the start of project construction, the project owner shall submit to the CPM 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 DPRS, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-4 The DPRS 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 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.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the DPRS.

PAL-5 The project owner, through the DPRS, 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 DPRS 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 Paleontological Resources Report (PRR) and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a PRR by the DPRS. The PRR 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 PRR 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 DPRS that project impacts to paleontological resources have been mitigated.

Verification: The project owner shall submit a copy of the PRR to the CPM for review and approval under a cover letter stating that it is a confidential document. The PRR is to be prepared by the DPRS within 90 days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding facility closure activity's potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM 12 months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the PRR and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

REFERENCES

CDMG (California Division of Mines and Geology). 1992. (Fourth reprinting) Geologic Map of California, Bakersfield Sheet, Scale 1:250,000.

CDMG (California Division of Mines and Geology). 1994. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, Scale: 1:750,000.

FEMA (Federal Emergency Management Agency). 1986. Flood Insurance Rate Map No. 060075-1200 B panel no. 1200, (Kern County, California) dated September 29, 1986.

Midway (Western Midway Sunset Co) 1999a. Application for Certification. Submitted to the California Energy Commission/Smith on December 22, 1999.

NOAA (National Oceanic and Atmospheric Administration). 1973. Precipitation-Frequency Atlas of the Western United States, Volume XI-California, Figure 40.

SVP (Society of Vertebrate Paleontologists). 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures. October 1994.

FACILITY DESIGN

Testimony of Steve Baker, Al McCuen and Kisabuli

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering aspects of the project. The purpose of the Facility Design analysis is to verify that the laws, ordinances, regulations and standards (LORS) applicable to the design and construction of the project 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 identifies the design review and construction inspection process and establishes conditions of certification that will be used to ensure compliance with 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] (b) 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:

1. Identification of the LORS applicable to facility design;
2. Evaluation of the applicant’s proposed design criteria, including the identification of those criteria that are essential to ensuring protection of the environment and public health and safety;
3. Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable LORS;
4. Identification of the Energy Commission’s design review and construction inspection process, which is used to ensure compliance with applicable LORS and protection of the environment and public health and safety; and
5. Conditions of certification 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

Midway Sunset Cogeneration Company (MSCC) filed an Application for Certification (AFC) for the Western Midway Sunset Cogeneration Company Project (Western MSCC). The proposed project is a nominal 500-megawatt (MW), natural gas-fired, combined cycle, electric generating facility. The power plant will use existing MSCC facilities and pipelines.

Major features of the power plant include two 170 MW Combustion Turbine Generators (CTG), two Heat Recovery Steam Generators (HRSG), one 160 MW Steam Turbine Generator (STG), and one seven-cell cooling tower. Each HRSG will be equipped with a Selective Catalytic Reduction (SCR) emission control system. The project also includes a new 230 kV switchyard and a new 19-mile, 230 kV transmission line connecting with Pacific Gas and Electric Company's (PG&E) transmission system.

The site is about 40 miles south west of Bakersfield, California, and 2.5 miles west of the unincorporated community of Derby Acres, California. The Proposed facility is in section 17, Township 31 south, Range 22 East, Mount Diablo Base and Meridian on West Crocker Springs Road. The 10-acre site is adjacent to the existing MSCC facility site. State Highway 33 runs northwest and southeast approximately 2.5 miles east of the site.

The site is located in seismic zone 4, the highest seismic shaking zone in the country. Additional engineering details of the proposed project are contained in the AFC, in Appendices D and E (Midway 1999a). For more information on the site and related project description, please see the **Project Description** section.

CONSTRUCTION AND OPERATION

The applicant plans to begin construction immediately after certification, which is expected to occur in March 2001 and run through October 2002 for a period of 20 months. Commercial operation should occur by the fall of 2002. There will be a peak work force of approximately 400 individuals and about 5 additional permanent facility operations personnel enhancing the existing MSCC power plant staff.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The applicable LORS for each engineering discipline, civil, structural, mechanical and electrical, are included in the application as part of the engineering appendices, Appendices C through H, and summarized in Section 7, Table 7-1 (Midway 1999a). A summary of these LORS includes: Title 24, California Code of Regulations, which adopts the current edition of the California Building Code (CBC) as minimum legal building standards; the 1998 CBC for design of structures; American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; and National Electrical Manufacturers Association (NEMA) standards.

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 1.5	Facility Location and Description
Section 3.3	Site Description
Section 3.4	Facility Description
Section 3.5	Facility Civil/Structural Features
Section 3.8	Project Construction
Section 7	Compliance with Applicable Laws, Ordinances, Regulations and Standards (LORS)
Section 7.3	Project Siting and Construction

Appendices:

1. Appendix C	Civil Engineering Design Criteria
2. Appendix D	Structural Engineering Design Criteria (inc. Seismic and Foundations)
3. Appendix E	Mechanical Engineering Design Criteria
4. Appendix F1	Electrical Engineering Design Criteria
5. Appendix G	Control Systems Engineering Design Criteria
6. Appendix H	Geotechnical Report

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 an electric transmission line. The applicant proposes to use accepted industry standards (see AFC Section 7 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, including its linear facilities, will likely comply with all applicable site preparation LORS, and proposes conditions of certification included 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 (**GEN-2** below).

The AFC contains a list of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable LORS, and which staff believes are essential to ensuring that the project is designed in a manner that protects the environment and public health and safety.

PROPOSED MODIFICATIONS

The AFC (Midway 1999a, Section 7, and Appendices C and D) identifies LORS applicable to the project. The project should be designed and constructed to the 1998 edition of the CBC, and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the design of the Western MSCC project is submitted to the Chief Building Official (CBO)[1] for review and approval when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

CBC LATERAL FORCE REQUIREMENTS

The procedures and limitations for the seismic design of structures by the 1998 CBC are determined considering seismic zoning, site characteristics, occupancy, structural configuration, structural system and height. Different design and analysis procedures are recognized in the 1998 CBC for determining seismic effects on structures. The dynamic lateral force procedure of Section 1631 is always acceptable for design. The static lateral force procedure of Section 1630 is allowed under certain conditions of regularity, occupancy and height as determined under Section 1629. Nonbuilding structures (such as cooling towers, tanks and heat recovery steam generators) are included in Section 1634. Most of the structures in powerplant projects are considered nonbuilding structures.

STATIC LATERAL FORCE PROCEDURE

In seismic Zones 3 and 4, the static lateral force procedure of Section 1630 may be used for the following:

1. Regular structures under 240 feet in height with lateral force resistance provided by systems, listed in Table 16-N, except where Section 1629.8.4, Item 4, applies. (Structures, regular or irregular, located on Soil Profile Type S_F, that has a period of vibration greater than 0.7 second require dynamic analysis.)
2. Irregular structures not more than five stories or 65 feet in height.

DYNAMIC LATERAL FORCE PROCEDURE

In seismic zones 3 and 4, the dynamic lateral force procedure of Section 1631 shall be used for all other structures, including the following:

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[1]The CBO is the CEC's duly appointed representative, who may be the City or County Chief Building Official, or other appointed representative.

1. Structures having a stiffness, weight or geometric vertical irregularity of Type 1, 2 or 3, as defined in Table 16-L, or structures having irregular features not described in Table 16-L or 16-M, except as permitted by Section 1630.4.2. (Where a combination of structural systems is included in the same structure, the structure can be analyzed as two independent structures for purposes of determining regularity.)
2. Structures over five stories or 65 feet, not having the same structural system throughout their height except as permitted by Section 1631.2. (An elastic design response spectrum constructed in accordance with Figure 16-3 of the 1998 CBC, using the values of C_a and C_v consistent with the specific site can be used.)
3. Structures, regular or irregular, located on Soil Profile Type S_F, that have a period greater than 0.7 seconds.

RIGID STRUCTURES LATERAL FORCE DESIGN

Rigid structures (those with a fundamental period of vibration less than 0.06 second) and their anchorage shall be designed using procedures consistent with the requirements of Section 1634.3 and any other applicable provisions of Section 1634.

TANKS WITH SUPPORTED BOTTOMS

Flat bottom tanks or other tanks with supported bottoms founded at or below grade shall be designed consistent with Section 1634.4 and any other applicable provisions of Section 1634.

OTHER NON-BUILDING STRUCTURES

Non-building structures not covered by Sections 1634.3 and 1634.4 shall be designed consistent with the requirements of Section 1634.5 and any other applicable provisions of Section 1634.

ENSURING THE APPROPRIATE LATERAL FORCE PROCEDURE

In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1** below, which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

CIVIL/STRUCTURAL FEATURES

The applicant proposes, and staff concurs that small, lightly loaded structures not subject to vibratory loading be supported on shallow footings or mat foundations on properly compacted fill or undisturbed native soils. Foundation depth should extend to at least 12 inches below lowest adjacent grade. If any portion of the foundation bears on bedrock, the entire foundation should be deepened to bear on bedrock. Large, heavily loaded structures, and structures subjected to vibratory loading, should be constructed on deepened foundations that bear on bedrock. Such foundations may include deepened footing or concrete reinforced pier and grade

beams. The powerplant and related facilities shall be designed to meet the seismic requirements of the latest edition of the California Building Code.

MECHANICAL SYSTEMS

The major features of the power plant are the two power trains with two 170 MW natural gas fired, F-class combustion turbine generators (CTG), operating in combined cycle mode. Each CTG will be equipped with an inlet air evaporative cooling system to enhance performance on hot days. The CTGs will be installed in a two-on-one configuration with the steam turbine generator (STG) rated at 160 MW. The heat from hot exhaust gas, which flows from each CTG through a heat recovery steam generator (HRSG), will be extracted to produce steam to power the STG. The HRSG design will be a supplementary fired, three-pressure reheat type with horizontal flow.

Other features of the project include: water and wastewater treatment facilities; pressure vessels, piping systems and pumps; aqueous ammonia storage, handling and piping system; air compressors; fire protection systems; and heating, ventilation, air conditioning (HVAC), potable water, plumbing and sanitary sewage systems.

MECHANICAL LORS AND DESIGN CRITERIA

The application (Midway 1999a, Appendix E) lists 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 features of the project other than transmission include generators, power control wiring, protective relaying, grounding system, cathodic protection system and site lighting (Midway 1999a, Appendix F1).

Power and Control Wiring. In general, conductors will be insulated based on 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.

Protective Relaying. These relays protect equipment in the auxiliary power supply system, generator terminal systems, 230 kV system, 4.16 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.

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's National Fire Protection Association/American National Standards Institute (NFPA/ANSI), Section C1.

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.

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 277 volts.

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.

Cathodic Protection System. 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 will be provided as required.

The AFC (Midway 1999a, Appendix F1) lists 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 (Midway 1999a, Appendix F1). Staff has proposed conditions of certification (**ELEC-1** and **ELEC-2**, below) to monitor this compliance.

ANCILLARY FACILITIES

Transmission Line: The Western MSCC project will transmit power through a new 19-mile 230 kV transmission line to be constructed parallel to and within the existing 230 kV line corridor which connects the existing MSCC plant to PG&E's Midway Substation at Buttonwillow, California.

Natural Gas Pipeline: The natural gas fuel for the project will be supplied by Kern/Mojave and Southern California Gas Company using the two existing gas pipelines. The existing gas lines are sufficient to supply both the Western MSCC project and the existing MSCC facility. No new gas pipelines will be constructed.

Water Pipeline: West Kern Water District will provide 15,500-acre feet of untreated water per year supplied by a new 1.8-mile pipeline. The existing MSCC plant system will provide all potable and steam cycle makeup water required by the project.

PROJECT QUALITY PROCEDURES

The AFC (Midway 1999a AFC § 4.3.7) describes a Project Quality 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. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will ensure that the project is designed, procured, fabricated and installed in accordance with LORS.

COMPLIANCE MONITORING

THE ENERGY COMMISSION'S DESIGN REVIEW AND CONSTRUCTION INSPECTION PROCESS

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and ensure that all facility design conditions of certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegate agents typically include the local building official and independent consultants hired to cover technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff has completed, or will complete, the following to ensure the design review and construction inspection process is consistent with the applicant's timing of the project:

1. Staff will meet with the local building department to discuss the Energy Commission's compliance process and the potential involvement of the local building official as delegate agent.

2. Staff will propose a memorandum of understanding (MOU) with Kern County outlining the roles and responsibilities of the County and its subcontractors as delegate agents appointed by the Energy Commission to ensure compliance with the CBC and facility design conditions of certification.
3. Staff will meet with the County and its subcontractor (if applicable) to discuss the details of the design review and construction inspection process, fees, types of submittals required of the process and timing of the review.

Staff has developed conditions of certification (see the section below, titled "Proposed Conditions of Certification") to ensure compliance with LORS and protection of the environment and public health and safety. Some of these conditions address the roles, responsibilities and qualifications of the Western MSCC project engineers responsible for the design and construction of the project (proposed conditions of certification **GEN-1** through **GEN-8**). 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 proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility with construction activities, these conditions are written to require that no element of construction of permanent facilities, which is difficult to reverse, may proceed without prior approval of plans from the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall have the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

FACILITY CLOSURE

A facility closure was evaluated under three scenarios; Planned Closure, Unexpected Temporary Closure and Unexpected Permanent Closure.

PLANNED CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities. Future conditions that may affect the decommissioning Decision are largely unknown at this time.

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 the commencement of decommissioning. The plan shall include a discussion of the following items:

1. Proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
2. 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;
3. The activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
4. 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 in the Planned Closure.

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."

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed a Condition of Certification (**GEN-9**) to ensure that these measures are included in the Facility Closure Plan.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The laws, ordinances, regulations, and standards (LORS), identified in the AFC and supporting documents, 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 are likely to 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 phases.
3. The conditions of certification proposed 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 to ensure satisfactory performance.

4. The Energy Commission design review and construction inspection process will be in place for the project and will allow construction to start as scheduled if the project is certified. The process will provide the necessary reviews to ensure compliance with applicable facility design LORS and conditions of certification.
5. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan required by GEN-9, prior to the commencement of decommissioning, that the decommissioning procedure is likely to result in satisfactory decommissioning performance.

RECOMMENDATIONS

If the Energy Commission certifies the project, staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to comply with applicable LORS, and also to protect environmental quality, and assure public health and safety;
2. The project should be designed and built to the 1998 CBC (or successor standard, if such is in effect); and
3. The CBO shall review the final designs, conduct plan checking and perfo rm field inspections during construction, and staff audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC)[2] 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. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: In the event that the Western MSCC project is submitted to the CBO when a successor to the 1998 CBC is in effect, 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

[2] The Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to the Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).

general requirement and a specific requirement, the specific requirement shall govern.

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 California Energy Commission Compliance Project Manager (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 Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy.]

GEN-2 The project owner shall furnish to the 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 of, and a list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and equipment in **Table 1: Major Equipment List** below). To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Table 1: Major Equipment List

Equipment/System	Qty	Size/capacity*	Service/Remarks
Combustion Turbine Generator (CTG)	2	170 MW each	DLN combustion control, inlet evaporative cooling
Heat Recovery Steam Generator (HRSG)	2	1,800 psig HP steam	Three pressures with reheat and supplementary firing
HRSG Stack	2		19' dia. x 140' high
Cooling Tower	1	7 Cells	Serve as fire water reservoir
Aqueous Ammonia Storage Tank	1	50,000 gal.	19 wt. % ammonia solution for NO_X control
SCR System including Ammonia Injection Package	2	NO_X reduction	NO_X control
Oxidation Catalyst	2		VOC and CO control
HP Boiler Feedwater Pumps	4	1,115 gpm	HP feed (Two x 100% per HRSG capacity)
Steam Turbine Generator (STG)	1	182 MW	Condensing reheat STG
Deaerating Surface Condenser	1	980 MMBtu/hr	
Vacuum Condensate Pump	2	2,483 gpm	Vertical (2-100% capacity)
Cooling Water Pumps	2	53,230 gpm	Vertical (2-50% capacity)
Fuel Gas Filter Separator	2	26,476 SCFM	Natural gas fuel
Closed Loop Cooling water Pump	2	2,608 gpm	Generator and lube oil cooling (2-100% capacity)
Closed Loop Cooling Water Heat Exchangers (new)	2	42 MMBtu/hr	Generator and lube oil cooling (2-100% capacity)
Continuous Emission Monitoring System (CEMS)	2	NO_X, CO & O_2	HRSG stack

***All capacities and sizes are approximate and may change during project final design.**

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 fees have 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 Regs., tit. 24, § 4-209, Designation of Responsibilities).]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: 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.

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, these Conditions of Certification, 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 fully competent and proficient in the design of powerplant 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.]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

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, powerplant 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, shall:

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's 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, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1,

TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

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 for corrective action; 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 by the 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 engineering and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

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 Kern County and the CPM for review and approval at least 12 months (or other mutually agreed to time) prior to commencing the closure activities. If the project is abandoned before construction is completed, the project owner shall return the site to its original condition.

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 Western MSCC project 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. Prior to the submittal of the closure plan, a meeting shall be held between the project owner and the CPM for discussing the specific contents of the plan.

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, Chapter 1, 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.

Protocol: 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 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 proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for:

1. Major project structures;
2. Major foundations, equipment supports and anchorage;
3. Large field fabricated tanks; and
4. Turbine/generator pedestal.

In addition, the project owner shall, prior to the start of any increment of construction, get approval from the CBO of the lateral force procedures proposed for project structures to comply with the lateral force provisions of the CBC.

Protocol: The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. 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];
3. 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 (or a lesser number of days mutually agreed to by the project owner and the CBO), 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

4. 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 Energy 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 the 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 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, Ip = 1.5 and Iw = 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 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:

1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission's Decision; and
2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:

   - American National Standards Institute (ANSI) B31.1 (Power Piping Code);
   - ANSI B31.2 (Fuel Gas Piping Code);
   - ANSI B31.3 (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 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 above listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission's 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.]

Protocol: The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

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.

Protocol: The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, 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.]

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 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.]

Protocol: The project owner shall design, fabricate and install:

1. Plumbing, potable water, all drainage systems, and 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 Energy Commission's 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 480 volts and higher 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.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: The following activities shall be reported in the Monthly Compliance Report:

- receipt or delay of major electrical equipment;
- testing or energization of major electrical equipment; and
- 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 for electrical equipment and systems 480 volts and greater, 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.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission Engineering** portion of this document.

Protocol: 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.

Protocol: 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.

Protocol: 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 Energy 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 electrical equipment and systems 480 volts and greater 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

CEC (California Energy Commission) 2000f. Data Adequacy Recommendation. Submitted to the California Energy Commission/Jack Caswell on January 21, 2000.

CEC (California Energy Commission) 2000i. Western Midway Sunset Cogeneration Company Application for Certification – Supplemental Material. Submitted to the Agency list on February 22, 2000.

CEC (California Energy Commission/Pernell) 2000r. Workshop Notice on Data Requests (Attachment: Proof of Service). Submitted to the California Energy Commission/Docket on March 31, 2000.

CEC (California Energy Commission/Caswell) 2000s. Project Issue Identification Report (Attachment: Proof of Service) submitted to the California Energy Commission Commissioners Pernell & Laurie.

CEC (California Energy Commission/Caswell) 2000v. Data Requests. Submitted to WZI Inc./Wilson on March 6, 2000.

Midway (Western Midway Sunset Co) 1999a. Application for Certification. Submitted to the California Energy Commission/Smith on December 22, 1999.

Midway (Western Midway Sunset Co) 2000d. Supplementary AFC Material in Response to Data Adequacy Worksheets. Submitted to the California Energy Commission on February 9, 2000.

Midway (Western Midway Sunset Co.) 2000n. Supplementary AFC Material #2 (Supplementary information previously submitted on February 18, 2000, February 22, 2000, February 23, 2000 and February 25, 2000) (Attachment: Proof of Service) Submitted to the California Energy Commission on March 2, 2000.

Planning (Planning Dept. Kern County/Bob B. Blalock) 2000b. Review and Comments of AFC of the Western Midway Sunset Cogeneration Company. Submitted to the California Energy Commission on February 2, 2000.

POWER PLANT RELIABILITY

Testimony of Steve Baker

INTRODUCTION

In this analysis, Energy Commission 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. Staff uses this level of reliability as a benchmark because the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

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 Midway Sunset Cogeneration Company (MSCC) has predicted a level of reliability for the power plant (see below), staff believes MSCC 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 (LORS)

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 (see **Setting** below).

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 (PX) to purchase, dispatch and sell electric power throughout the state. How Cal-ISO will ensure system reliability is currently being determined; protocols are 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 being employed to ensure an adequate supply of reliable power (Mavis 1998, pers. comm.).

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the Cal-ISO (Detmers 1999, pers. comm.).

The Cal-ISO's mechanisms to ensure adequate power plant reliability 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 on power plant owners to minimize capital and maintenance expenditures may 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 are accustomed.

MSCC proposes to operate the 500 MW Western Midway Sunset Cogeneration Company Project (Western MSCC) at baseload, selling energy and capacity on the market and via bilateral contracts. In addition, MSCC proposes to provide load following and peaking power and black start capability (Midway 1999a, AFC §§ 1.6, 2.1, 2.2, 4.3.3). The project is expected to operate at an overall availability of 95 percent or higher (Midway 1999a, AFC §§ 4.3.1, 4.3.1.1, 4.3.1.2.1, 4.3.1.3, 4.3.4).

ANALYSIS

A reliable power plant is one that is available when called upon to operate. Throughout its intended life, the Western MSCC project will be expected to perform

reliably in baseload and load following duty. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the Western MSCC project will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

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, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

QA/QC PROGRAM

The QA/QC program delineated by MSCC (Midway 1999a, AFC §§ 4.3.7, 7.4.1.2) describes a program typical of the power industry. Equipment and supplies will be purchased from qualified suppliers of proven capabilities in accordance with the QA plan. Systems and components will be tested and inspected, and the QC process will be audited. 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**.

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.

MSCC plans to provide appropriate redundancy of function for the combined cycle portion of the project (Midway 1999a, AFC §§ 3.4.5.8, 3.4.5.9, 3.4.14, 3.7.2, 3.9.2.3, 3.9.2.6, 4.3.2.2; Tables 3.4-1, 4.3-1). The fact that the project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output) (Midway 1999a, AFC § 4.3.2.1). Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency DC and AC power systems will be supplied by redundant batteries, chargers and inverters. Balance of plant equipment will be provided with redundant examples, thus:

- two 100 percent boiler feed pumps per HRSG;
- two 50 percent circulating water pumps;

- two 100 percent closed loop cooling water pumps;
- two 100 percent closed loop cooling water heat exchangers;
- three 50 percent raw water transfer pumps; and
- two 100 percent air compressors.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

MAINTENANCE PROGRAM

MSCC proposes to establish a plant maintenance program typical of the industry (Midway 1999a, AFC §§ 3.9.2.2, 4.3.1, 4.3.1.1, 4.3.1.3, 4.3.4, 7.4.1.2). Maintenance outages will be planned for periods of low electricity demand. The maintenance program will be an extension of the maintenance program currently employed on the existing MSCC power plant. MSCC points to a ten-year reliability factor of 99.61 percent and a ten-year availability factor of 97.55 percent[1] for the existing facility as evidence of a successful maintenance program. In conjunction with an overall plant quality control program (Midway 1999a, AFC §§ 4.3.7, 7.4.1.2), staff expects that this will ensure that the project will be adequately maintained to ensure acceptable reliability.

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

The Western MSCC project will burn natural gas from existing Kern River/Mojave and Southern California Gas Company (SoCalGas) pipelines that supply the existing MSCC power plant. Gas will be transmitted to the plant via an existing 14-inch diameter pipeline from the Kern River/Mojave pipeline; and also via an existing SoCalGas line that connects to SoCalGas's Line 85 (Midway 1999a, AFC §§ 1.1, 1.5.5, 3.1, 3.4.1, 3.4.6, 3.7.1.1, 3.7.1.2, 3.9.4). This natural gas system, which provides access to gas from the Northwest and the Southwest, represents a resource of considerable capacity. This system offers access to far more gas than the plant would require (Midway 1999a, AFC §§ 1.5.5, 3.7.1). 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

The Western MSCC project will obtain raw cooling water from the West Kern Water District (WKWD) via a new 1.8-mile-long, 16-inch diameter pipeline. WKWD's

[1] Reliability factor is a measure of unexpected, or unscheduled, downtime of the facility. Availability factor includes scheduled downtime, e.g., periodic maintenance outages.

allotment of State Water Project water, along with its water-banking program, represents a substantial source of water. Potable water and water for steam cycle makeup will be supplied from an existing MSCC plant pipeline (Midway 1999a, AFC §§ 1.5.6, 3.1, 3.4.1, 3.4.4.4, 3.4.7, 3.7.2, 3.9.4, 7.4.1.2).

Staff believes this plan yields sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see that portion of this document entitled **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 flooding and seismic shaking (earthquake) present credible threats to reliable operation (see those portions of this document entitled **Facility Design** and **Geology and Paleontology**).

FLOODING

The project site does not lie within a 100-year flood zone (Midway 1999a, AFC §§ 3.3.3.1, 4.1.1.2). The applicant will design the Western MSCC project to withstand a 25-year, 24-hour storm (Midway 1999a, AFC § 4.1.1.2). For further discussion, see that portion of this document entitled **Geology and Paleontology**.

SEISMIC SHAKING

The site lies within Seismic Zone 4 (Midway 1999a, AFC §§ 1.8.2, 3.3.2.3, 3.5.10, 4.1.1.1). No active earthquake faults lie nearby; see that portion of this document entitled **Geology and Paleontology**. The project will be designed and constructed to the latest appropriate LORS. 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. 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. Staff has proposed conditions of certification to ensure this; see that portion of this document entitled **Facility Design**. 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.

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 (http://www.nerc.com). NERC reports the following summary generating unit statistics for the years 1994 through 1998 (NERC 1999):

For Combined Cycle units (All MW sizes)
Availability Factor = 91.49 percent

Both the candidate gas turbines that may 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 annual availability factor of 95 percent or greater (Midway 1999a, AFC § 4.3.1.1) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. Further, since the plant will consist of two parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures (Midway 1999a, AFC §§ 3.9.2.2, 4.3.1.1, 4.3.1.3, 4.3.4). The applicant's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact project reliability. Reliability impacts on the electric system from facility closure, should there be any, are dealt with in that portion of this document entitled **Transmission System Engineering**.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

No comments were received regarding Power Plant Reliability.

CONCLUSION

The applicant predicts an equivalent availability factor of 95 percent or higher, which staff believes is achievable in light of the industry norm of 91 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

Detmers, Jim. 1999. Director of Maintenance and Reliability, California Independent System Operator. Interview with Steve Baker (California Energy Commission), July 13, 1999.

GTW (Gas Turbine World). 1999. *Gas Turbine World*, September-October 1999, pp. 20-23.

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.

Midway (Western Midway Sunset Co.). 1999a. Application for Certification, Western Midway Sunset Cogeneration Company Project (99-AFC-9). Submitted to the California Energy Commission, December 22, 1999.

NERC (North American Electric Reliability Council). 1999. 1994-1998 Generating Availability Report.

POWER PLANT EFFICIENCY

Testimony of Steve Baker

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Western Midway Sunset Cogeneration Company Project (Western MSCC) 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 Western MSCC project'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.

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 GUIDELINES

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)). Appendix F of the Guidelines further suggests consideration of such factors as 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, § 15000 et seq., Appendix F).

LOCAL

No local or county ordinances apply to power plant efficiency.

SETTING

Midway Sunset Cogeneration Company (MSCC) proposes to construct and operate a (nominal) 500 MW combined cycle power plant to generate baseload, load-following and peaking power and energy, and black start capability (Midway 1999a, AFC §§ 1.1, 1.5.2, 1.6, 2.2, 3.9.2, 4.3.3). The Western MSCC project will consist of two F-class combustion turbine generators with evaporative inlet air coolers producing approximately 170 MW each, two heat recovery steam generators (HRSGs) with duct burners, and one 160 MW reheat steam turbine generator, arranged in a two-on-one combined cycle train, totaling approximately 500 MW (Midway 1999a, AFC §§ 1.1, 1.5.2, 3.4.4.1, 3.4.4.2, 3.9.2.1, 3.11.3.3.4). The gas turbines and HRSGs will be equipped with dry low-NOx combustors and selective catalytic reduction to control air emissions (Midway 1999a, AFC §§ 1.5.2, 3.4.4.1).

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.

PROJECT ENERGY REQUIREMENTS AND ENERGY USE EFFICIENCY

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. The Western MSCC project will burn natural gas at a nominal rate up to 94 billion Btu per day LHV[1] (Midway 1999a, AFC § 1.5.5). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

Under expected project conditions, electricity will be generated at a peak load annual average efficiency of approximately 54.6 percent LHV (Midway 1999a, AFC Appendix A, Table A-4); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

The applicant has described its sources of supply of natural gas for the Western MSCC project (Midway 1999a, AFC §§ 1.1, 1.5.5, 3.1, 3.4.6, 3.7.1, 3.9.4). The project will burn natural gas from existing Kern River/Mojave and Southern California Gas Company (SoCalGas) pipelines that supply the existing MSCC

[1] Lower heating value.

power plant. The gas supply infrastructure is extensive, with pipelines owned by Kern River Gas Transmission Company and Mojave Pipeline Company, and those owned by SoCalGas, offering access to vast reserves of gas from the Northwest and Southwest. These sources represent far more gas than would be required for a project this size. It is therefore highly unlikely that the Western MSCC project could pose a substantial increase in demand for natural gas in California.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

Natural gas fuel will be supplied to the project via an existing 3.8-mile long, 14-inch diameter pipeline from the existing Kern River/Mojave pipeline. This line is of sufficient capacity to serve both the Western MSCC project and the existing MSCC power plant. In addition, a second line connects SoCalGas's Line 85 to the projects; this, too, is of adequate size to supply both power plants (Midway 1999a, AFC §§ 1.1, 1.5.5, 2.2, 3.1, 3.4.1, 3.4.6, 3.7.1.1, 3.7.1.2). This natural gas supply system is so large and well established, that there is no real likelihood the Western MSCC project will require development of additional energy supply capacity.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the Western MSCC project or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT AND UNNECESSARY ENERGY CONSUMPTION

The Western MSCC project could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. Evaluation of alternatives to the project that could reduce wasteful, inefficient or unnecessary energy consumption first requires examination of the project's 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 used to generate power.

PROJECT CONFIGURATION

The Western MSCC project will be configured as a compound-train combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a reheat steam turbine that operates on heat energy recuperated from the gas turbines' exhaust (Midway 1999a, AFC §§ 1.5.2, 3.1, 3.4.1, 4.3.2.1). 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 gas turbine. This allows the plant to generate at less than full load while maintaining optimum efficiency, suitable for a plant meant for flexible generation, such as load-following duty. Loads down to 50 percent of full load allow one gas turbine, operating at full load, and the steam turbine to maintain peak efficiency.

EQUIPMENT SELECTION

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The F-class gas turbines to be employed in the Western MSCC project represent some of the most modern and efficient such machines now available. The applicant will employ a combined cycle power train from a prominent manufacturer. One candidate machine is the General Electric (GE) Frame 7FA, an F-class gas turbine nominally rated at 530 MW and 56.5 percent efficiency at ISO[2] conditions in a two-on-one combined cycle configuration (GTW 1999b). (The applicant predicts an annual average fuel efficiency, at actual site conditions, of 54.6 percent LHV (Midway 1999a, AFC Appendix A, Table A-4).)

Another candidate is the Siemens-Westinghouse 501F, nominally rated in a two-on-one combined cycle at 550 MW and 55.8 percent efficiency LHV at ISO conditions (Midway 1999a, AFC §§ 1.5.2, 3.11.3.3.3; GTW 1999b). This machine is functionally equivalent to the GE Frame 7FA.

A possible alternative to the GE and Siemens-Westinghouse machines is the ASEA Brown-Boveri (ABB) KA-24, still another F-class machine. While the KA-24 promises slightly higher fuel efficiency (57.6 percent at ISO conditions) (GTW 1999b) than the other F-class machines, any differences among the three in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, ability to meet air pollution limitations, and commercial availability. The ABB machine, for instance, is available only in one-on-one power trains, with one gas turbine and one steam turbine paired on a single shaft, generating a nominal 271 MW (Orsini 1999, pers. comm.). The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer an advantage here.

EFFICIENCY OF ALTERNATIVES TO THE PROJECT

The project objectives include the flexibility to generate baseload, load following or peaking electricity, as market conditions dictate, and black start capability in conjunction with the existing Midway Sunset Cogen power plant (Midway 1999a, AFC §§ 1.6.2.2, 4.3.3).

Alternative Generating Technologies

The applicant addresses alternative generating technologies in its application (Midway 1999a, AFC § 3.11.3). Hydroelectric, biomass and geothermal technologies are all considered. One of the project's stated objectives is to maximize use of existing infrastructure, including the existing natural gas supply system (Midway 1999a, AFC §§ 1.1, 2.1, 3.11.3.2). Given the project objectives,

[2] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

location and air pollution control requirements, staff agrees with the applicant 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.

One possible alternative to an F-class gas turbine is a G-class machine, such as the Siemens-Westinghouse 501G gas turbine generator, which employs partial steam cooling to allow slightly higher temperatures, yielding greater efficiency. While the 501G is rated at 58 percent efficiency (GTW 1999b), 2.2 percent higher than the 501F, the G machine produces 365 MW to the 501F's 273.5 MW. A 500 MW power plant would thus be impractical; a 365 MW power plant, without redundant gas turbines, would restrict operating flexibility. Additionally, the 501G is brand new; the first such machine has only recently begun operating at a site in Florida owned by Lakeland Electric and Water (Power 1999), and a second such machine is in construction at PG&E Generating's Millennium project in Charlton, Massachusetts. Given the minor efficiency improvement promised by the G-class turbine, the likelihood that the plant may frequently be dispatched at less than full load, and the lack of a proven track record for the 501G, the applicant's decision to purchase F-class machines is a reasonable one.

Another possible alternative to the F-class gas turbine is an H-class machine. The first such plant is now in the permitting stage; Sithe Energies will build an 800 MW facility in Scriba, New York, based on two General Electric Frame 7H gas turbine generators in a two-on-one configuration (GTW 1999a). Claimed fuel efficiency is 60 percent LHV at ISO conditions (GTW 1999b). This high efficiency is achieved through a higher pressure ratio and higher firing temperature, made possible by cooling the initial turbine stages with steam instead of air. This first Frame 7H application is not expected to enter service until the end of 2002. Given the lack of proven performance, and the reduction in operating flexibility from fewer gas turbines (one 7H combined cycle would produce 400 MW), staff agrees with the applicant's decision to employ F-class machines.

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 power output by cooling the gas turbine inlet air. A chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An evaporative cooler boosts power output best on dry days; it uses less electric power than a chiller, possibly yielding slightly higher operating efficiency.

The applicant proposes to use evaporative cooling, but holds open the possibility of switching to a chiller if market conditions warrant (Midway 1999a, AFC §§ 1.5.2, 3.4.4.1, 3.4.7, 3.9.2.1, 3.11.3.3.4). The difference in efficiency between these techniques is relatively insignificant. Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (two-train combined cycle) and generating equipment (F-class gas turbines) chosen appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

CUMULATIVE IMPACTS

Nearby power plant projects that hold the potential for cumulative impacts when aggregated with the Western MSCC project include the La Paloma Generating Project, the Elk Hills Power Project, and the Sunrise Cogeneration and Power Project. As discussed above, supplies of natural gas fuel, and the means for transporting this fuel to the facilities consuming it, are more than adequate. These several power plants will not strain the resource to a degree that could result in cumulative energy impacts.

Staff believes that construction and operation of the Western MSCC project will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for the Western MSCC project. California's electric power will be generated by those power plants that bid most successfully to sell their output to the California Power Exchange. Since no significantly more efficient power plants are envisioned to compete against the Western MSCC project, no indirect impacts are likely.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, will not 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.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

No comments were received regarding Power Plant Efficiency.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The Western MSCC project, if constructed and operated as proposed, would generate 500 MW of electric power at an overall project fuel efficiency of approximately 54.6 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. No energy standards apply to the project. Staff therefore concludes that the Western MSCC project would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

From the standpoint of energy efficiency, staff recommends certification of the Western MSCC project. No Conditions of Certification are proposed.

REFERENCES

GTW (Gas Turbine World). 1999 a. *Gas Turbine World*, November/December 1999, page 42.

GTW (Gas Turbine World). 1999 b. *Gas Turbine World 1999-2000 Performance Specs*, volume 19. December 1999.

Midway (Western Midway Sunset Co.). 1999a. Application for Certification, Western Midway Sunset Cogeneration Company Project (99-AFC-9). Submitted to the California Energy Commission, December 22, 1999.

Orsini, S. 1999. Applications Engineer, ABB Power Generation Systems, Inc. Telephone conversation with Steve Baker (California Energy Commission), February 18, 1999.

Power (Power Magazine). 1994. "Operating and maintaining IPP/cogen facilities," *Power*, September 1994, p. 14.

Power (Power Magazine). 1999. "Huge and tiny turbine projects move forward," *Power*, September/October 1999, p. 5.

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 assessment 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 Midway Sunset Cogeneration Company (MSCC), the applicant, proposes to connect their project, the Western Midway Sunset Cogeneration Company Project (Western MSCC) to Pacific Gas and Electric'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 the project's compliance with applicable reliability standards, and the need for additional transmission facilities. Environmental review of the project is performed by the Energy Commission and other agencies. 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.

Staff's analysis also evaluates the power plant switchyard, outlet line, termination facilities and 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 action," which may include facilities not licensed by the Energy Commission (CCR, tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental impact 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 provide 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 island 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 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. 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 to the assessment of the system reliability implications of the Western MSCC project. Also of major importance to 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 the actual net power output required by the generating units to meet their scheduled obligations. (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 Western MSCC project will provide a nominal electrical output of 500 megawatts (MW). The site is approximately 40 miles west of Bakersfield and directly adjacent to the existing MSCC cogeneration facility. The applicant plans to connect the project to the Midway substation through a new 230 kV switchyard and a 230 kilovolt (kV) (see **Definition of Terms**) transmission line with a bundled conductor approximately 19 miles long (Midway1999a, page 1-3 and 3.4-7).

Based on the Preliminary Facility Study the operation of the PG&E Western MSCC project will not require the construction of downstream transmission facilities.

PROJECT SWITCHYARD

The project switchyard will be constructed in a ring bus configuration with six circuit breakers. Three new generators, the new transmission line and the outlet line from the existing power plant will be connected to this ring bus (Midway 1999a, pages 3.4-15 to 3.4-17). This configuration for the project switchyard is acceptable.

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 switchyard components will be rated in accordance with the results of a short-circuit study. The acceptability of breaker ratings will be verified during the compliance phase of the certification process.

TRANSMISSION LINE CHARACTERISTICS

The proposed line will be a 230 kV line overhead line with a bundled conductor extending approximately 19 miles from the proposed MSCC power plant switchyard

to the existing Midway substation. The line will terminate at a new 230 kV bay at the Midway substation. Each phase of the bundled three-phase line will be made of 1590 kcmil All Aluminum Conductor. The normal rating for this conductor at 230 kV is approximately 531 MW. Thus, the total expected capacity of the transmission line under normal conditions will be approximately 1,062 MW (Midway 1999a, page 3.6-1). Several types of poles will support the line, including single shaft tubular steel poles, heavy and light angles, dead-end structures and finally T-tops will be used to cross under existing lines. Approximately 141 pole structures will be used to support the transmission line (Midway 1999a, pages 3.6-2 and 3.6-3). This configuration of conductors and support structures is acceptable.

EXISTING FACILITIES AND RELATED SYSTEMS

Specific facilities in close proximity to the interconnection include (Midway 1999a, page 3.6-2):

- The existing MSCC 230 kV line to the Midway substation.
- The Proposed La Paloma Generating Project's 230 kV line to the Midway substation.
- The Diablo – Midway #2 500 kV transmission line.
- Numerous transmission lines entering the Midway substation.

SYSTEM RELIABILITY

INTRODUCTION

A system reliability study is performed to determine the affects of connecting a new power plant to the existing electric grid. The study identifies impacts and also ways negative impacts can be minimized or negated. Any new transmission facilities such as the power plant switchyard, the outlet line, or downstream facilities, required for connecting a project to the grid are considered part of the project and are subject to the full AFC review process.

The System Impact Study (SIS) for the Western MSCC project indicated the need for an increase in the 500 kV to 230 kV transformer capacity at the Midway substation and possibly the need for reconductoring or re-rating of the Morro Bay to Templeton 230 kV line. The SIS for Western MSCC included both the Morro Bay Power Plant Project (Morro Bay) and the Elk Hills Power Project (Elk Hills). However, since February 2000, when the SIS for the Western MSCC project was performed, some assumptions have changed. Both of the Morro Bay and Elk Hills projects fell behind Western MSCC in PG&E's interconnection queue and therefore they should not be assumed as operating in the SIS (Midway 2000j, pages 1-4). The proposed Elk Hills project was studied in its SIS by PG&E at 503 MW for the summer peak and is very similar to the 513 MW (at summer peak) project proposed by Western MSCC. One sensitivity study in the Elk Hills SIS included only the La Paloma and Sunrise Projects making the study results similar to those staff expects for the Western MSCC project. Based on the SIS for the Elk Hills, the interconnection of the Western MSCC to the Midway substation will not result in the need for downstream facilities (Elk Hills 1999a, all). A complete reliability analysis,

in this case the Detailed Facility Study, for the Western MSCC project will be finished near the end of October 2000.

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 may be 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 Detailed Facilities Study (DFS) is conducted in advance of potential system changes, such as the addition of the Western MSCC project 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.

Due to the changes in PG&E's generation interconnection queue and the expected operation date for the Western MSCC project, the SIS submitted in the Western MSCC AFC is inadequate; however, staff is confident that the operation of the project will not require significant downstream electric transmission facilities. The study included four potential generation projects in the same, general area, the La Paloma Generating Project (La Paloma), Sunrise Cogeneration and Power Project (Sunrise), Morro Bay Power Plant Project and the Elk Hills Power Plant Project. According to PG&E's interconnection protocols, Western MSCC is only responsible for system impacts that are caused by the operation of La Paloma, Sunrise and the Western MSCC project. The SIS included an analysis of the impact of Western MSCC in 2001 and the project is not scheduled to operate before the November of 2002. Thus, the SIS submitted by Western MSCC includes too many potential projects, analyzed an inappropriate year, and shows the need for facilities for which Western MSCC is not responsible.

The Western MSCC SIS study indicated that the operation of their project would result in the need for increased transformer capacity at the Midway substation and for either a re-rating or reconductoring of the Morro Bay – Templeton 230 kV line. The SIS included four potential projects when Western MSCC is responsible only for the impacts of itself after two of those projects are in service. The projects that should not be operating in the SIS are the 1000 MW Morro Bay project and the 500 MW Elk Hills project. The SIS for Elk Hills indicated that the generator would be required to participate in a remedial action scheme (RAS) designed to prevent emergency overloads on the Midway 500/230 kV transformers. The Cal-ISO has given the Western MSCC project its preliminary approval requiring only the mitigation of the Midway transformer overload (Cal-ISO 2000 b, page 1). Thus, no downstream facilities were found needed for the interconnection of the Western MSCC project. **Condition of Certification 1h** ensures that the project participates in any Cal-ISO required RAS.

The California Department of Water Resources (CDWR) has indicated that it is concerned that facilities connecting at the Midway substation will impact its electrical equipment in the area (Water 2000a, page 1 and SWPA 2000a, page 1). **Condition of Certification 1i)** requires the applicant to consult with the CDWR about impacts to their facilities.

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). Generally when circuit breakers are not adequate the applicant must replace them. The replacement of circuit breakers is usually a "within the fence" modification and does not warrant further environmental analysis. The short-circuit analysis will be completed in the Detailed Facilities Study and **Condition of Certification 1b)** ensures that impacts of the project are adequately mitigated.

ALTERNATIVES

This section addresses transmission alternatives studied for the proposed site. Alternative site analysis is presented in the **Alternatives** section of the staff assessment.

ALTERNATIVE TRANSMISSION LINE ROUTES

MSCC analyzed two interconnection alternatives for the Western MSCC project. One alternative transmission line route was a connection to the proposed Sunrise Cogeneration and Power Project (Sunrise Project) and from there to the Midway substation. The other alternative transmission line route connected to the proposed La Paloma Generating Project (La Paloma Project) and from there to the Midway substation. As it is now proposed, the Sunrise Project will interconnect to the La Paloma Project. Thus, both alternatives would result in all three projects connecting to the Midway substation through lines on one transmission line tower structure. Thus, a single line outage could jeopardize the delivery of 2000 MW of generation to the grid. Connecting all three projects on one tower structure would increase spinning reserve requirements in California under average load conditions and could increase electricity costs (Midway 1999a, pages 3.11-15 and 3.11-16). Staff and the Cal-ISO consider carrying all three projects on the same line highly undesirable.

CUMULATIVE IMPACTS

Several projects have either been approved (La Paloma Generating Project), are seeking Energy Commission certification (Sunrise Cogeneration and Power Project and the Elk Hills Power Project) or are expected to re-file an AFC (Morro Bay Power Plant Project) which have direct, significant impacts on the same electrical facilities as the Western MSCC project. The proposed Pastoria Power Plant Project is geographically close to the proposed Western MSCC project but is not electrically close and thus is an insignificant factor. Other proposed projects in California are either located far enough away from the proposed project that they do not significantly impact transmission lines affected by the Western MSCC site or they will be indirectly studied as part of the Detailed Facilities Study.

The La Paloma Generating Project, the Sunrise Cogeneration and Power Project, the Elk Hills Generating Project, and the Morro Bay Power Plant Project will significantly impact the same transmission facilities as the Western MSCC site. The original SIS provided in the Western MSCC AFC included all of the Kern county projects plus Morro Bay and found that actions are required to prevent the overload of several electric facilities in the area. These actions could include increasing the ratings of the electric facilities or implementing congestion management techniques (Midway 1999a, System Impact Study). These facilities include:

- The Morro Bay – Templeton 230 kV line which overloads to 109% of it's normal rating. This overload could be mitigated by re-conductoring or re-rating the line or through congestion management. Reconductoring would cause significant environmental impacts while re-rating or congestion management would not have any direct environmental impacts.
- The Midway substation 500/230 kV transformer Bank#12 (BK#12)) overloads when the 500/230 kV transformer Bank#11 (BK#11) is out of service and the BK#11 overloads when BK#12 is out of service. Overloads due to outages are generally mitigated with RAS and in this case participation in RAS is the expected mitigation.
- During winter and spring, under normal conditions, with all facilities in service, BK#11 and BK#12 will overload. Mitigating this overload will require replacing the existing banks with higher rated banks or adding a new 500/230 kV transformer bank. Replacing the existing banks would be a change within the existing substation fenceline while addition of a new bank would require an outside the fenceline modification requiring environmental analysis.

The proposed Pastoria Energy Facility (PEF) while located geographically close to the Western MSCC project is electrically distant. The PEF will connect to the Edison electric network at the Pastoria substation. This substation is part of a radial electric system that primarily delivers power from the Big Creek hydroelectric plants and several qualifying facilities to southern California. The Antelope Valley Project, which hasn't filed an AFC at the Energy Commission, would connect at the Antelope Valley substation that is also part of the Big Creek radial system. This radial network feeds into the Edison system and would not significantly affect the electrical systems around the Midway substation. Other projects connecting to the Edison or San Diego Gas and Electric systems will not have significant affects around the Midway substation.

Staff does not expect any other cumulative impacts resulting from other proposed or approved power plants operating in northern California or southern California and the Western MSCC project. Other plants are both electrically distant and their impacts are studied generically in the existing System Impact Study. The Midway substation lies between two MSCC defined transmission paths, Path 15 and Path 26 (see Figure 1)[1]. Path 15 limits the amount of power that flows from generators

[1] Path ratings and names are listed in the WSCC Path Rating Catalog. Path 15 refers to two 500 kV lines from the Midway substation to the Los Banos substation and four 230 kV lines heading north from the Gregg substation. Path 26 refers to the three 500 kV lines from the Midway substation to the Vincent substation.

electrically south of the Midway substation to areas electrically north of the Midway substation. Path 26 limits the quantity of power flows from areas north of the Midway substation to areas south of the Midway substation. The path limits or ratings represent the maximum amount of power that can flow in a given direction regardless of the quantity of generation available. System Impact Studies for proposed plants in California generally include several cases and at least one case with maximum electricity flows over Path 26 (North to South) and at least one case with maximum electricity flows over Path 15 (South to North). The cases with Path 26 at its limit study the maximum effect of new generation north of the Midway substation on areas south of the Midway substation. The cases with Path 15 at its limit study the maximum impact of new generation south the Midway substation on areas north of the Midway substation. Thus the cumulative impacts of the Western MSCC project on transmission systems in northern and southern California have been studied and included in the analysis of other projects. The operation of the Western MSCC power plant will not result in the need for new facilities in regions north of Path 15 or south of Path 26 beyond those already identified by projects proposed in those regions. Therefore staff concludes that the Western MSCC project does not cause significant cumulative impacts.

FACILITY CLOSURE

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[2] 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, the 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.” A condition of certification will require compliance with this rule. The ability of the above LORS to

[2] 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 re-close the system.

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 provides time for the owner to coordinate with the PTO[3] to assure (as one example) that the PTO's system will not be closed into the outlet thus energizing the project substation. 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.[4]

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 provide power to 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's findings indicate that no significant additional new facilities will be required for interconnection of the Western MSCC project to meet NERC, WSCC, and Cal-ISO reliability criteria.

The Cal-ISO will confirm staff's conclusion upon issuance of the final interconnection approval.

[3] The PTO, in this instance, is PG&E, e.g., the system owner to which the project is interconnected.

[4] These are mere examples, many more exist.

The power plant switchyard, outlet lines, and termination are acceptable and will comply with LORS assuming the conditions of certification are implemented.

The Cal-ISO will provide testimony on the preliminary approval letter at the Commissions hearings.

The issuance of the Cal-ISO's final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. A condition of certification TSE-1h provides for Energy Commission review of the Cal-ISO final interconnection approval letter and the PG&E/applicant Facility Interconnection Agreement.

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 "equivalent" equipment and equivalent switchyard configurations are acceptable.

The power plant switchyard, outlet line and termination shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", National Electric Code (NEC), and related Industry Standards.

Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

The Western MSCC 230 kV switchyard shall include six circuit breakers in a ring bus scheme.

The new transmission line will be a 230 kV overhead line with a bundled conductor terminating at the Midway substation.

Termination facilities at the interconnection shall comply with applicable Cal-ISO and PG&E interconnection standards (PG&E Interconnection Handbook and CPUC Rule 21).

Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.

The outlet line will use conductors similar to the 1590 kcmil AAC conductors.

The applicant shall provide a Detailed Facilities Study including a description of remedial action scheme sequencing and timing and an executed Generator Special Facilities Agreement (GSFA) for the transmission interconnection with PG&E. The Detailed Facilities Study and GSFA shall be coordinated with the Cal-ISO.

The applicant shall consult with the CDWR to insure that the impacts of the Western MSCC interconnection and operation on CDWR resources is minimized.

Verification: At least 60 days prior to start of construction of transmission facilities, the project owner shall submit for approval to the CPM:

a) Design drawings, specifications and calculations conforming with CPUC General Order 95 and related industry standards, where applicable, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

b) For each element of the transmission facilities as identified above, the submittal package to the CPM shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions" and a statement by the registered engineer in responsible charge (signed and sealed) that the transmission element(s) will conform with CPUC General Order 95, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", the NEC, PG&E Interconnection Handbook, CPUC Rule 21 and related industry standards.

c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements a) through h) above. The Detailed Facilities Study and GSFA shall concurrently be provided. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CPM approval.

d) A signed letter from the CDWR indicating that they have been consulted and that any impacts to their facilities have been adequately mitigated.

TSE-2 The project owner shall inform the CPM of any impending changes, which may not conform to the requirements 1a through 1i 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, transmission facilities 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 General Order 95, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", the NEC, PG&E Interconnection Handbook, CPUC Rule 21 and related industry standards. 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 first synchronization of the project, the project owner shall transmit to the CPM:

"As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC General Order 95, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", the NEC, PG&E Interconnection Handbook, CPUC Rule 21 and related industry standards, and these conditions shall be concurrently provided.

An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge.

A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in responsible charge.

REFERENCES

Cal-ISO (California Independent System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

Cal-ISO (California Independent System Operator). 1998b. Cal-ISO Dispatch Protocol posted April 1998.

Cal-ISO (California Independent System Operator) 2000a. Cal-ISO Preliminary Approval Letter for PEF, submitted to the California Energy Commission on August 29, 2000.

ISO (California ISO/Green) 2000a. Conclusion and Preliminary Findings. Submitted to the Midway Sunset Co. on March 29, 2000.
Cited in the text as: (ISO 2000a)

ISO (California ISO/Miller) 2000a. Conclusion and Preliminary Findings. Submitted to the Midway Sunset Co. on August 30, 2000.
Cited in the text as: (ISO 2000b)

EHPP (Elk Hills Power Project). 1999a. Application for Certification, Elk Hills Power Project (99-AFC-1). Submitted to the California Energy Commission, February 24.

Midway (Western Midway Sunset Co) 1999a. Application for Certification. Submitted to the California Energy Commission/Smith on December 22, 1999.Cited in the text as: (Midway 1999a)

Midway (Western Midway Sunset Co.) 2000j. Final System Impact Study. Submitted to the California Energy Commission on February 22, 2000. Cited in the text as (Midway 2000j)

NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September 1997.

SWPA (State Water Project Analysis Office/Henry M. Ramie) 2000a. Letter of concern that the total combined short circuit current contribution by the facility will exceed the short circuit current ratings of electrical equipment. Submitted to the California Energy Commission Eileen Allen on January 25, 2000. Cited in text as (SWPA 2000a)

Water (Department of Water Resources/Ramirez) 2000a. Letter of concern RE: total combined short circuit current contribution by this power facility, in combination with three other new power facilities will exceed the short circuit current ratings of out electrical equipment. Submitted to the California Energy Commission on January 24, 2000.

Cited in text as (Water 2000a)

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

DEFINITION OF TERMS

AAC — All Aluminum conductor.

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.

Loop — An electrical cul de sac. A transmission configuration which interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

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.

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.

Switchyard A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

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.

Figure 1

PART VI

Item 1-37

ALTERNATIVES

Testimony of Jack W. Caswell

PURPOSE OF THE ALTERNATIVES ANALYSIS

Staff is required to examine the "feasibility of available site and facility alternatives to the applicant's proposal that 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 of which the effect cannot be reasonably ascertained and of which the 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.)

ALTERNATIVES ANAYSIS METHODOLGY

To prepare the alternatives analysis, the staff used the methodology summarized below:

- describe the project objectives;
- identify any potential significant environmental impacts of the project;
- evaluate the environmental impacts of not constructing the project to determine whether the "no project" alternative is superior to the project as proposed;
- evaluate alternative technologies;
- determine which, if any, of the potential significant impacts could potentially be avoided by use of an alternative site;

- develop screening criteria for feasibility of alternative sites;
- select a reasonable range of alternative sites that meet most of the basic objectives of the project, and avoid or substantially lessen one or more of the potential significant effects of the project;
- satisfy the feasibility screening criteria;
- if any alternative sites are deemed infeasible, explain why;
- evaluate the environmental impacts of each feasible alternative site;
- compare the environmental impacts of the alternative sites with the proposed project to determine whether the environmental impacts of the alternative are the same, better, or worse than the proposed project.

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.

In considering location alternatives, the staff determined a reasonable geographical area. Since alternatives must consider the underlying objectives of the proposed project, staff confined the geographic area for location alternatives to Western Kern County. The alternatives are consistent with the MSCC objectives and the applicant's siting criteria of use of previously disturbed areas; existence of a restricted access land buffer, close proximity to and availability of suitable transmission line interconnections, process water and natural gas supplies; compatibility with oil field activities, proximity to the existing MSCC power plant facility; and other environmental considerations such as visual resources and air quality. (MSCC AFC 1-1 to 3.11-17)

PROJECT OBJECTIVES

The Western MSCC application states that the project has the following objectives:

1. The construction and operation of a merchant power plant that utilizes its existing infrastructure and supplies economic, reliable, and environmentally sound electrical energy and capacity in the newly deregulated energy market.

2. To locate near the existing MSCC power plant and infrastructure, to include transmission line interconnections, supplies of process water and natural gas.

PROJECT DESCRIPTION AND SETTING

A more complete description of the project and its setting is in the "Project Description" section of this Preliminary Staff Assessment (PSA).

WESTERN MSCC POWER PLANT

Located in the western Kern County region, the Midway Oil Field has been heavily exploited for oil and natural gas production since the early 20th Century. Although zoned primarily as agricultural land, the Midway Oil Field has seen little, typical agricultural activities, such as the raising of crops and with some cattle grazing. Narrow and deep ravines, extensive oil production, and MSCCs existing Cogeneration power plant characterize much of the terrain. Scattered throughout the field are well sites that have been leveled to accommodate drilling, access roads, power supply lines, and pipelines for assorted uses.

The proposed Western MSCC project would be a nominal 500-megawatt, combined-cycle, natural gas-fired power plant with two combustion turbine generators/heat recovery steam generator (HRSG) combinations. Steam generated in the two HRSGs would be combined and used to run one steam turbine generator. The power plant would be located on 10-acres next to the existing MSCC power plant. The Facility Operation will be accomplished with 30 existing full time MSCC employees and 5 additional full time employees. The existing facility contains a back up control room that allows the plant to be operated from two separate location in the event of an emergency **"ALTERNATIVES Figure 1"** for a map of the location of the proposed project site and related facilities.

RELATED FACILITIES

MSCC POWER PLANT

The proposed Western MSCC power plant would be the second power plant located in the Midway Oil Field. Adjacent to the proposed site is the existing 225-Megawatt MSCC power plant. The MSCC site is a Cogeneration facility and provides steam as well as electricity to the Midway oil field.

TRANSMISSION LINE

Electricity generated by the Western MSCC facility would be transmitted to Pacific Gas & Electric's (PG&E) Midway Substation at the unincorporated community of Buttonwillow, approximately nineteen miles from the power plant site. The applicant has provided two alternative transmission line route analysis, A and B. It is the applicant's opinion that both alternative routes were explored to minimize impacts.

ALTERNATIVES Figure 1
Location of the Proposed Site and Related Facilities

RAW WATER SUPPLY PIPELINE

Water for the Western MSCC project would be supplied by the West Kern Water District (WKWD) via a new 1.8-mile long, 16-inch steel pipeline extending from WKWD's existing facilities east of the proposed power plant site. The proposed pipeline Rout 2 begins at WKWD's line 303 in section 15, T31S, R22E, MDB&M and is within the existing MSCC pipeline corridor.

LIQUID WASTEWATER DISPOSAL

An on-site leaching field with buried sewer piping will be used for the sanitary wastewater. Process rejected water will be reclaimed at the existing MSCC facility.

NATURAL GAS SUPPLY PIPELINE

Locally produced natural gas would be supplied to the power plant via two existing gas pipelines located at the existing MSCC power plant. This pipeline would be mounted above ground on pipe supports within the proposed power plant and existing MSCC facility.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

At this time there no technical areas that have been identified as having potential significant environmental impacts. It is staff's opinion that the mitigation measures the applicant has proposed will reduce any potential environmental impacts to less than significant levels.

ALTERNATIVES TO THE PROJECT

GENERATION TECHNOLOGY ALTERNATIVES

Public Resources Code, section 25305(c) limits the scope of the alternatives analyses 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.

Staff compared various alternative technologies with the proposed project, scaled to meet the project's objectives. Technologies examined were those principal electricity generation technologies which do not burn fossil fuels such as natural gas: solar and wind[1]. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions.

[1] Previous staff research has determined that there are no geothermal or hydroelectric resources in western San Joaquin Valley region (La Paloma Generating Project, Final Staff Assessment, April 1999. & Elk Hills L.L.C. Final Staff Assessment, April 2000)

Solar and wind resources require large land areas in order to generate 500 megawatts of electricity. Specifically, central receiver solar thermal projects require approximately 9 to 10 acres per megawatt; 500 megawatts would require approximately 4,500 to 5,000 acres, or about 400 times the amount of space taken by the proposed plant site and linear facilities. Parabolic trough solar thermal technology requires similar acreage per megawatt. Wind generation "farms" generally require about 17 acres per megawatt, with 500 megawatts requiring 8,500 acres, more than 700 times the amount of space taken by the proposed plant site and linear facilities. (CEC 1996, pp. B.15.2 & B.15.3)

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 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, hydroelectric, solar, and wind technologies present any feasible alternatives to the proposed project.

ALTERNATIVE SITE SCREENING ANALYSIS

POWER PLANT SITING ALTERNATIVES

Staff examined the three siting alternatives proposed by the applicant, "Alternative Sites" A & B are located in the same general location as the existing MSCC power plant and site C is located in the "AERA Energy Company " property in Coalinga oil field. (Western MSCC AFC Volume I, pp. 3.11-2 through 3.11-6) The basic characteristics of each site that differentiates it from the others, including the preferred site, are presented below. **Please see "ALTERNATIVES Figure 2".**

SITE A (PREFERRED SITE)

"Site A" (preferred) is primarily located on existing MSCC property and is adjacent to the existing MSCC facility allowing utilization of the former construction laydown area as new construction laydown and minor facilities for the Western MSCC project. This site allows the two projects to share infrastructure, employees, control room, waste storage, road access, transmission, black start capability, gas pipelines and other associated operational needs. **Please see "ALTERNATIVES Figure 3".**

ALTERNATIVES Figure 2
Location of Alternative Sites

ALTERNATIVES Figure 3
Lay-out of Proposed Power Plant Project

ADVANTAGES (SITE A)

- Utilizes the same transmission corridor as the current facility;
- will not require a new gas pipeline, an in-plant connection will be required only;
- a new water line using the existing right -of-way to the current plant location;
- recycling of the cooling tower blowdown to current MSCC facility makeup water;
- oil field setting with all liner facilities in similar existing land use setting;
- suitable geological and flood plain conditions;
- allows utilization of previously disturbed land for the majority of project needs;
- endangered species and cultural impacts are minimized;
- minimizes visual impact for facility and transmission line corridors.

ALTERNATIVE SITE B

"Alternative Site" B is on MSCC property to the south and west of the existing MSCC power plant. It allows all of the same advantages as discussed in Site A preferred with the exception of the disadvantages described below. See **ALTERNATIVES Figure 2".**

DISADVANTAGES (SITE B COMPARED TO SITE A)

- Facility would be on acreage that was formerly laydown for the existing MSCC plant creating the need for a new laydown area;
- rerouting of West Crocker Springs Road to the south of the Western MSCC site;
- construction close to an area of potential endangered species impact;
- requires a change in the orientation of the power block creating less favorable air emissions from the stacks than Site A.

ALTERNATIVE SITE C

Alternative Site C is located on Aera Energy Oil Field property Section 36, T19S, R15E, MDB&M and has very few of the advantages of Site A or Site B. This site would allow for utilization of some of the existing infrastructure of the Aera Energy oil operations and would constitute a Greenfield site development. The disadvantages of this site as compared to Sites A & B are described below. See **"ALTERNATIVES Figure 2"**

DISADVANTAGES (SITE C COMPARED TO SITES A & B)

- Gas line interconnection would occur on five miles of primarily undisturbed property;
- transmission line interconnection would occur on fourteen miles of primarily undisturbed property;

- water pipeline connection for Aera Energy recycling cooling would occur on one mile of primarily undisturbed property;
- conditional Use Permit would be required from the county of Fresno;
- larger foot print and corridors for linear facilities would encroach on previously undisturbed areas designated for habitat preserve;
- site Greenfield status may impact cultural resources.

RELATED FACILITIES ALTERNATIVES

The following related facilities pertain only to those associated with the applicant's preferred power plant site.

TRANSMISSION LINES

DISCUSSION:

In the Conditions of Certifications (MSCC's 85-3) from the Energy Commission, MSCC was directed, where practical to obtain a right-of-way (ROW) along transmission corridor wide enough to accommodate an additional power line. MSCC acquired a 200 foot ROW over 72% of the 19-mile transmission route large enough to accommodating two transmission lines. Part of the transmission route land requires BLM's ROW approval and they granted a 100-foot ROW for its section of the route in 1987. BLM is currently reviewing a request for amending the original ROW adding the needed 100 feet of ROW. This ROW will accommodate 94% of the 19-mile route leaving two parcels still yet to be acquired.

ALTERNATIVE A

Discussions were held with Texaco's Sunrise project in pursuit of building a joint line to the Midway Substation using MSCC's Right of Way. While the joint line is feasible, the timing difference between the Sunrise project and Western MSCC project was too great. Sunrise has elected to build a joint line with the La Paloma project to the Midway Substation. (99-AFC 3.11.7.1)

ALTERNATIVE B

MSCC has considered asking La Paloma and Sunrise to join in as joint developers in the transmission line and route to the Midway Substation. Discussion was had with the Independent System Operators (ISO) and concern was expressed as to three projects on one tower line and their total capacity. A combined 1868 MW on one tower structure was not a good plan in the ISO's perspective. (99-AFC–9 3.11.7.1)

RAW WATER SUPPLY

Oil field produced water was investigated and discussions with West Kern Water District on availability where compared. Oil field water was not available while the water district had sufficient reserves. Ground water was reviewed and discovered that the total Dissolved solids (TDS) where higher than the levels of the processed

water discharged by the plant. The use of ground water was not considered a viable alternative as compared to the water districts offer

NATURAL GAS SUPPLY PIPELINE

Two gas pipelines currently exists at the MSCC power plant. The route necessary to connect the proposed power plant will be within the footprint of the proposed site. Therefore, staff concluded that route alternatives need not be examined.

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, the applicant presented the "No Project" alternative as not feasible. The following is supporting arguments for this conclusion (99-AFC-9 section 2.2 3.11.8).

1. The proposed project would serve to fill part of California's need for a substantial amount of additional generation capacity;
2. the proposed project will efficiently meet the needs of the consumer, while utilizing existing infrastructure in an environmentally sensitive manner;
3. existing power plants operating in place of the proposed Western MSCC project would most likely consume more fuel and emit more air pollutants per kilowatt-hour generated; and
4. the project would insulate ratepayers or taxpayers from risk, and would assist ratepayers by increasing competition and therefore decrease electricity rates.

If this project is not built, the same market conditions that encouraged it to be proposed will encourage others. Therefore, the "No Project" alternative is not feasible. It is quite feasible that a substantial amount of additional generating capacity will be proposed even in the absence of this project. Staff can reasonably expect California's need for new plants to be filled with or without the proposed project. There is no reason to assume that the total amount of capacity actually built would differ, with or without this project.

It follows then, that the extent to which retired, nuclear and fossil generation resources will be replaced by new resources can be expected to be the same with or without this project. However, the extent to which generation from existing power plants would consume fuel and emit pollutants would be different from the proposed project due to the benefits from the existing infrastructure, new BACT, and transmission line ROW currently in place. The cost effect due to current MSCC infrastructure will make for a more competitive market. The possibility of new plants insulating ratepayers and taxpayers from risk will occur whether or not the proposed plant is included among the power plants actually built.

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 $2.5 million annually. Local construction supply and materials purchases are estimated to be $25 million, the direct impact on lodging, eating, and drinking establishments would be $1.7 million with another $985,000 in indirect spending benefits. Plant operations are expected to create 5 permanent jobs at the Western MSCC facility and increase regional output by $120 million per year. (99-AFC-9, pp. 5.10-11 and 5.10-12.)

Staff has determined that the “No Project” alternative is potentially environmentally inferior when compared to environmental impacts for planned power projects in the same area. The Western MSCC project would not have any significant environmental impacts. Staff believes measures proposed by the applicant will reduce any impacts to less than significant levels, assuming staff’s belief that there are no potentially significant water resources impacts is correct. In addition, staff recognizes potential economic benefits will be derived from the project. Therefore, staff believes that, overall, the “No Project” alternative is not superior to the proposed project.

CONCLUSIONS AND RECOMMENDATION

Staff has determined the proposed power plant “Site A preferred” is the best option among those considered because it: 1) provides the closest and most direct access, 2) would present fewer impacts to biological, cultural and paleontological resources, 3) does not present as great a visual impact and air quality impacts as Alternative Site C, and 4) would not require longer water, natural gas supply and wastewater pipelines. Staff does not believe that energy efficiency measures and alternative technologies (geothermal, solar, wind, and hydroelectric) present any feasible alternatives to the proposed project.

Assuming there are no potential significant impacts that cannot be mitigated to less than significant levels, and other departments or agencies requested documents are provided in the appropriate time; staff recommends that the Energy Commission find the proposed Western MSCC site, raw water pipeline, wastewater disposal, and the natural gas supply pipeline to be the preferred options for these features. With regard to the transmission line route options, staff believes the existing transmission corridor and planned amended ROW is suitable because the environmental impacts associated with this route can be reduced to less than significant levels while creating the least disturbance to the area.

REFERENCES

Western Midway Sunset Cogeneration Company. Application for Certification December 22, 1999 DOC 99-AFC-9

Edmond Western, Project Director for Western MSCC Project. Personal communication with Jack Caswell.

CEC Preliminary Staff Assessment sections and CEC staff discussion with Jack Caswell

GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Connie Bruins

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have 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:

a. set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;

b. set forth the requirements for handling confidential records and maintaining the compliance record;

c. state procedures for settling disputes and making post-certification changes;

d. 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

e. establish requirements for facility closure plans.

Specific conditions of certification:

a. Specific conditions of certification that follow 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. ensuring 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 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.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Commission about power plant construction or operation-related questions, complaints or concerns.

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. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

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, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted 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. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

COMPLIANCE RECORD

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 unrestricted 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, and in most cases without full 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 audits of project records; and/or
4. Energy Commission staff inspections of mitigation and/or other evidence of mitigation.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

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 submittals 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

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 shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to

provide the CPM with the current status of all 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. 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.

PRE-CONSTRUCTION MATRIX

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner’s **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

TASKS PRIOR TO START OF CONSTRUCTION

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner’s own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for conditions of certification are established to allow sufficient staff time to review and comment, and if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

MONTHLY COMPLIANCE REPORT

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. 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.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. 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. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
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.
11. a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

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 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].
10. a listing of complaints, notices of violation, official warnings, and citations received during the year; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

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 shall pay a filing fee in the amount of eight hundred and fifty dollars ($850). The payment instrument shall be provided to the Commission's Project Manager at the time of project certification and shall be made payable to the California Department

of Fish and Game. The Commission's Project Manager will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision pursuant to Public Resources Code Section 21080.5.

REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering, with date and time stamp recording. The telephone number shall be posted at the project site and easily visible to passersby during construction and operation.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form on the following page.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME:
AFC Number:

COMPLAINT LOG NUMBER _____
Complainant's name and address:

Phone number:

Date and time complaint received:

Indicate if by telephone or in writing (attach copy if written):
Date of first occurrence:

Description of complaint (including dates, frequency, and duration):

Findings of investigation by plant personnel:

Indicate if complaint relates to violation of a CEC requirement:
Date complainant contacted to discuss findings:

Description of corrective measures taken or other complaint resolution:

Indicate if complainant agrees with proposed resolution:
If not, explain:

Other relevant information:

If corrective action necessary, date 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: _____ Date:

(Attach additional pages and supporting documentation, as required.)

FACILITY CLOSURE

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 that exist at the time of closure. 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

A 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

An unplanned 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.

UNEXPECTED PERMANENT CLOSURE

An unplanned 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.

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides 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 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission. The plan shall:

- identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site.
- identify 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;
- identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
- 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.

Also, in the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to, or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, 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 require 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 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 and Waste Management).

In addition, consistent with requirements under unexpected permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unexpected temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., 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 circumstances and expected duration of the closure.

If the CPM determines 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 developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

UNEXPECTED PERMANENT CLOSURE

The on-site contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely 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, etc., 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.

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

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. The specific action and amount of any fines the Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, inadvertence, unforseeable events, and other factors the Commission may consider.

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, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

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:

immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;

secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;

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; and,

after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which 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 General 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, INSIGNIFICANT PROJECT 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; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project 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 PROJECT CHANGE

The proposed change will be processed as an insignificant project change if it does not require changing the language in a condition of certification, have a potential for significant environmental impact, and 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	
Completion of Water Supply Line Construction	
Start Implementation of Erosion Control Measures	
Complete Implementation of Erosion Control Measures	

PREPARATION TEAM

Executive Summary.....Jack Caswell

Introduction.....Jack Caswell

Project Description.....Jack Caswell

Air Quality.....Joe Loyer

Public Health..... Obed Odoemelam

Worker Safety and Fire Protection..... Bob Strand and Kathi Haan

Transmission Line Safety and Nuisance..... Obed Odoemelam

Hazardous Materials..... Rick Tyler

Waste Management..... Michael Ringer

Land Use .....Amanda Stennick

Traffic and Transportation.....Eric Knight and Steven J. Brown

Noise .....Steve Baker and Thomas M. Murphy

Visual Resources .....David Flores

Cultural Resources .....Gary Reinoehl and Dorothy Torres

Socioeconomics..... Joe Diamond

Biology .....Rick York

Water and Soils ..... Jack Buckely, Joe Crea and Jim Henneforth

Geological and Paleontological Resources .....Robert Anderson

Facility Design .....M. Kisabuli, Steve Baker and Al McCuen

Reliability..... Steve Baker

Efficiency..... Steve Baker

Transmission System Engineering.....Mark Hesters and Al McCuen

Alternatives .....Jack Caswell

Compliance Monitoring Plan and General Conditions ..... Connie Bruins

Glossary of Terms and Acronyms ..... Jack Caswell

Project Secretary.....Chester Hong

Support Staff.....Luz Manriquez, Pat Owens, Mary Dyas