

Final Staff Assessment
(Part 1)

CALIFORNIA
ENERGY
COMMISSION

MOSS LANDING POWER PLANT PROJECT

Application For Certification (99-AFC-4)
Moss Landing - Monterey County

STAFF REPORT

MAY 2000
(99-AFC-4)



Gray Davis, Governor

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CALIFORNIA ENERGY COMMISSION

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EXECUTIVE SUMMARY

On May 7, 1999, Duke Energy Moss Landing LLC filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the proposed Moss Landing Power Plant Project (MLPPP). The AFC was determined to be data adequate by the Energy Commission at the August 11, 1999 business meeting. This finding begins staff's review and analysis of the project.

The existing Moss Landing Power Plant is an extensive industrial complex of 7 electric generation units, 8 225-foot exhaust stacks, 19 fuel storage tanks, 2 seawater inlet and out fall structures, various warehouse and office buildings, and other related equipment on a 239-acre site. The power plant has been generating electricity since 1950. Units 1-5 (613 MWs), originally built in the 1950's were shut down in 1995. Units 6 and 7 (1,500 MWs) are currently in operation. On July 1, 1998, Duke Energy purchased the 239-acre site from PG&E. PG&E retained the adjacent 500/230/115-kV substation.

The project is proposed to be located at the existing Moss Landing Power Plant site. This site is located about 12 miles northwest of Salinas, California in Monterey County at the intersection of Highway 1 and Dolan Road, east of the community of Moss Landing. The plant is situated near the Moss Landing Harbor in an area that includes industrial facilities, agricultural lands, residences, recreational beaches and tidal wetlands.

The Moss Landing Power Plant Project consists of replacing the existing electric power generation Units 1-5 with two 530 MW, natural gas-fired, combined cycle, units. Each combined cycle unit consists of two natural gas fired combustion turbine generators (CTGs), two unfired heat recovery steam generators (HRSGs) and a reheat, condensing steam turbine generator (STG). Each combined cycle unit will use seawater for once through cooling. In addition, they plan to dismantle 8 of the existing 225-foot stacks that were previously used for Units 1-5.

There are no linear facilities outside the property owned by Duke Energy and the adjacent PG&E substation. The natural gas pipeline connection, interconnection to the PG&E substation, and ocean water intake are all contained on these two adjacent properties.

In addition, Duke will be removing the large fuel storage tanks on site and adding Selective Catalytic Reduction (SCR; an air emission control technology) to existing Units 6 and 7. Monterey County is the lead agency for the environmental review of these projects, but the analysis in this document includes a discussion and analysis of any potential cumulative impacts from these projects.

If the project were to be approved by the Energy Commission, construction is expected to begin immediately after the decision and will take about 29 months. Full-scale commercial operation is expected by mid 2002. Duke Energy expects a peak work force of approximately 732 craft laborers, supervisory, support and

construction management personnel on the site during construction. The capital cost of the project is estimated to be about \$475 million.

ENERGY COMMISSION JURISDICTION

The Moss Landing Power Plant Project and related facilities are under the Energy Commission's jurisdiction (Pub. Resources Code (PRC) §§ 25500 et seq.). When issuing a license, the Energy Commission acts as lead state agency (PRC § 25519(c)) under the California Environmental Quality Act (PRC §§ 21000 et seq.), and its process is functionally equivalent to the preparation of an environmental impact report (PRC § 21080.5).

Staff's primary responsibility is to provide an independent assessment of the project's potentially significant effects on the environment, the public's health and safety, conformance with all applicable laws, ordinances, regulations and standards (LORS), and measures to mitigate any identified potential effects. The analyses contained in this document were prepared in accordance with PRC Sections 25500 et seq.; the California Code of Regulations (CCR) Title 20, Sections 1201 et seq.; and the California Environmental Quality Act (PRC §§ 21000 et seq.) and its guidelines (CCR title 14 §§ 15000 et seq.).

The Final Staff Assessment (FSA) presents Energy Commission staff's conclusions and recommended conditions of certification for the design, construction, operation and closure of the facility. The analyses contained in this document are based upon information from the AFC and subsequent revisions; responses to data requests; supplemental information from local, state and federal agencies, local citizens and interested parties; existing documents and publications; independent field study; and information gained from two days of publicly noticed workshops on the Preliminary Staff Assessment.

PUBLIC AND AGENCY COORDINATION

Extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff and Duke Energy have worked with the County of Monterey, Caltrans, California Independent System Operator (Cal-ISO), Monterey Bay Unified Air Pollution Control District, California Air Resources Board, U.S. Environmental Protection agency, California Coastal Commission, California Water Quality Control Board and the Regional Water Quality Control Board to identify and resolve issues of concern. In addition we have coordinated the review and analysis of the project with U.S. Fish and Wildlife Service, Department of Fish and Game, National Marine Fisheries, U.S. Army Corp of Engineers, and the interested residents of the community.

The Regional Water Quality Control Board has established a technical working group to advise on the Section 316(a) and 316(b) Clean Water Act studies. Duke Energy, the Regional Water Quality Control Board, the Energy Commission staff and other interested agencies have actively participated in reviewing the recently collected data.

Another important part of our coordination efforts has been with the California Coastal Commission. In accordance with state law, the California Coastal Commission is required to complete an analysis and provide the Energy Commission with their assessment of any power plant proposed in California's coastal zone. Originally the Coastal Commission had planned to complete its report and provide it to the Energy Commission prior to the FSA so that it could be incorporated into the document. For a variety of reasons this optimistic schedule did not occur.

STAFF'S ASSESSMENT

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

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

COMPLETE ANALYSES

Staff's FSA analyses will be published in three Parts. Part 1 consists of the following 17 technical areas, which staff considers substantially complete:

Need Conformance	Waste Management
Public Health	Geology and Paleontology
Hazardous Materials Handling	Facility Design
Transmission Line Safety & Nuisance	Reliability
Traffic and Transportation	Efficiency
Noise	Transmission System Engineering
Cultural Resources	Worker Safety and Fire Protection
Visual Resources	General Conditions/Compliance
Socioeconomics	

These topic areas were the subjects of workshop discussions in early 2000. Staff has received written comments from various parties on these sections. Staff's conclusions, recommendations and proposed conditions of certification for these topic areas have been modified, as staff deemed appropriate, to address these comments. Staff does not expect there to be any major controversy in the topic areas.

The Energy Commission has not received the Coastal Commission's report and assessment as required by California statute. However, we understand the Coastal Commission's concerns to focus on three topic areas: coastal access, impacts on marine biology and water resources. Impacts on marine biology and water resources will be addressed in Part 2 of the FSA. Coastal access issues have been coordinated with Monterey County, California Department of Transportation, and Coastal Commission and will be addressed in the land use section.

INCOMPLETE ANALYSES

Five technical areas, **Air Quality, Land Use, Soil and Water Resources, Biological Resources,** and **Alternatives** are incomplete. **Air Quality** and **Land Use** will be addressed in Part 2 of the FSA, to be published on May 31, 2000. **Soil & Water Resources, Biological Resources** and **Alternatives** will be published on June 6, 2001. The following provides a brief discussion on the status of staff's analysis in the topic areas.

AIR QUALITY

The Monterey Bay Unified Air Quality Management District (District) is expected to issue its Final Determination of Compliance (FDOC) in May 2000. Staff does not expect any major issues to arise from the FDOC. Our FSA on Air Quality will be published on May 31, 2000.

LAND USE

Staff is working with representatives of Monterey County and the Coastal Commission regarding a plan to develop public access to coastal resources pursuant to Public Resources Code section 25529. Our FSA on Land Use will be published on May 31, 2000.

BIOLOGICAL RESOURCES AND SOILS & WATER RESOURCES

Staff expects to receive the draft National Pollutant Discharge Elimination System (NPDES) permit conditions from the Central Coast Regional Water Quality Control Board (Board) in May. Staff would normally use a Draft Report from the Board, which would include the draft NPDES permit conditions as well as the Board staff's supporting analysis, as the basis of its assessment of the project's impacts and conformity with applicable regulations. However, in this case our FSA will be based on the draft permit conditions alone, and consequently, may be tentative. Our FSA on biological and soil & water resources will be published on June 6, 2000.

ALTERNATIVES

Since staff has not yet completed its air quality, biological resources and soil & water resources analyses, staff has delayed completion of its alternative analysis until Part 3 of the FSA.

STAFF RECOMMENDATION

Since staff has not completed its analyses for air quality, soil & water resources, biological resources, land use and alternatives, we believe it is premature to tender

any recommendations on the Moss Landing Power Plant Project. However, staff believes that issues in these topic areas can be resolved.

MOSS LANDING POWER PLANT PROJECT (99-AFC-4)
FINAL STAFF ASSESSMENT

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INTRODUCTION

On May 7, 1999, Duke Energy Moss Landing LLC filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the proposed 1060-megawatt (MW) Moss Landing Power Plant Project. On August 11, 1999, the Energy Commission found the AFC to be data adequate. Acceptance of the AFC by the Energy Commission initiates staff's review and analysis of the project.

This document presents the California Energy Commission staff's independent assessment¹ of Duke Energy's Application for Certification (AFC) for the Moss Landing Power Plant Project (MLPPP). The Final Staff Assessment (FSA) includes our evaluation of the proposed project in 17 technical areas.

ORGANIZATION OF THE REPORT

The FSA describes the following:

- the project and the existing environmental setting;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards;
- the environmental consequences of the project using mitigation measures proposed by Duke Energy, Energy Commission staff, and federal, state and local agencies;
- cumulative analysis of the potential impacts of the project along with the potential impacts from other existing developments or known planned developments;
- the proposed conditions under which the project should be constructed and operated if it is certified;
- project closure conditions; and
- project alternatives.

The staff assessment contained in this document is based upon information from the Application for Certification (Docket 99-AFC-4), supplemental AFC information filed by Duke Energy, responses to Energy Commission data requests, Duke Energy's mitigation measures, existing documents and publications, independent field studies and research, information gathered from local, state and federal agencies, and input provided by interested individuals and intervenors. The FSA

¹ The Energy Commission is responsible for reviewing and ultimately approving or denying all thermal electric power plants, 50 MW and greater, proposed for construction in California. The Commission's responsibilities are similar to those of a lead agency under the California Environmental Quality Act (CEQA). The FSA carefully examines public health and safety, environmental impacts and engineering aspects of proposed power plants and all related facilities such as electric transmission lines, natural gas pipelines and water lines. The FSA was prepared pursuant to Title 20, California Code of Regulations, Sections 1742.5, 1743 and 1744.

presents Energy Commission staff's conclusions and proposed conditions of certification applicable to both the construction and operation of the project.

The FSA contains an Executive Summary, Introduction, Project Description, Project Alternatives and staff recommendation on Need Conformance. The environmental, engineering, and public health and safety analysis of the proposed project is contained in 17 technical areas. Each technical area is included in a separate chapter and are as follows: air quality, public health, worker safety and fire protection, transmission line safety, hazardous material management, waste management, traffic and transportation, noise, visual resources, cultural resources, socioeconomics, biological resources, water resources, geology (including geologic hazards, surface water hydrology, paleontological resources, geological resources) facility design, power plant reliability, power plant efficiency and transmission system engineering. These chapters are followed by a discussion of facility closure, project construction and operation compliance monitoring plans, witness qualifications, glossary of terms and a list of staff that assisted in preparing this report.

Each of the 17 technical area assessments includes a discussion of:

- laws, ordinances, regulations and standards (LORS);
- the regional and site-specific setting;
- project specific and cumulative impacts;
- mitigation measures;
- closure requirements;
- conclusions and recommendations; and
- conditions of certification for both construction and operation (if applicable)

In addition to the project as described, Duke will be removing the large fuel storage tanks on site and adding SCR (air emission control technology) to existing Units 6 and 7. Monterey County is the lead agency for the environmental review of these projects. However, the analysis in this document includes a discussion and analysis of any potential cumulative impacts from these projects and appropriate conditions of certification.

FEDERAL, STATE AND LOCAL AGENCY COORDINATION

Two days of workshops on the Preliminary Staff Assessment (PSA) were held to receive input from intervenors, interested public participants, and local, state, and federal agencies. Input from these publicly noticed workshops was incorporated into the Final Staff Assessment.

In addition to the PSA workshops, extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff and Duke Energy have worked with the County of Monterey, California Department of Transportation, California Independent System Operator (Cal-ISO), Monterey Bay Unified Air Pollution Control

District, California Air Resources Board, U.S. Environmental Protection Agency, California Coastal Commission, California Water Control Board and the Regional Water Quality Control Board to identify and resolve issues of concern. In addition we have coordinated the review and analysis of the project with U.S. Fish and Wildlife Service, Department of Fish and Game, National Marine Fisheries, U.S. Army Corp of Engineers, California Unions for Reliable Energy, and the interested residents of the community.

An important part of our coordination efforts has been with the California Coastal Commission. In accordance with state law, the California Coastal Commission is required to complete an analysis and provide the Energy Commission with their assessment of any power plant proposed in California's coastal zone. Originally the Coastal Commission had planned to complete its report and provide it to the Energy Commission prior to the FSA so that it could be incorporated into the document. For a variety of reasons this optimistic schedule did not occur.

PROJECT DESCRIPTION

Testimony of Paul Richins

The existing Moss Landing Power Plant is an extensive industrial complex of 7 electric generation units, 8 225-foot exhaust stacks, 19 fuel storage tanks, 2 seawater inlet and out fall structures, various warehouse and office buildings, and other related equipment on a 239-acre site. The power plant has been generating electricity since 1950. Units 1-5 (613 MWs), originally built in the 1950's was shut down in 1995. Units 6 and 7 (1,500 MWs), are currently in operation. On July 1, 1998, Duke Energy purchased the 239-acre site from PG&E. PG&E retained the adjacent 500/230/115-kV substation.

The project is proposed to be located at the existing Moss Landing Power Plant site. This site is located about 12 miles northwest of Salinas, California in Monterey County at the intersection of Highway 1 and Dolan Road, east of the community of Moss Landing. The plant is situated near the Moss Landing Harbor in an area that includes industrial facilities, agricultural lands, spare residences, recreational beaches and tidal wetlands. The site is bordered by Highway 1 and the Moss Landing Harbor on the west, Dolan Road and Moro Cojo Slough on the south, and Elkhorn Slough including the Elkhorn Slough National Estuarine Research Reserve to the north.

The project, proposed by Duke Energy, consists of two 530 MW, natural gas-fired, combined cycle, units. Each combined cycle unit includes two natural gas-fired combustion turbine generators (CTGs), two unfired heat recovery steam generators (HRSGs) and a reheat, condensing steam turbine generator (STG). Each combined cycle unit will use seawater for once through cooling. Duke Energy originally proposed to upgrade each of the existing Units 6 and 7 by replacing the high pressure rotors and increasing the steam flow rate. This would have produced 146 MWs (73 MWs each) of additional capacity but was dropped by Duke. In addition, they plan to dismantle 8 of the existing 225-foot stacks that were previously used for Units 1-5.

In a supplement to the AFC, Duke Energy dropped the upgrade to Units 6 and 7. The project that is now under the Energy Commission's jurisdiction is 1,060 MWs in size.

There are no linear facilities outside the property owned by Duke Energy and the adjacent PG&E substation. The natural gas pipeline connection, interconnection to the PG&E substation, ocean water intake are all contained on these two adjacent properties.

- The two new electric generating units will supply an additional 1060 MW of electricity to the 230-kV transmission system and through the 230/115-kV transformer into the 115-kV system at the PG&E substation located at the site. An additional 30 MW from Units 6 and 7 will be added to the 500-kV system.

- Natural gas is available on site and a short line will be constructed to the two new units.
- Duke Energy proposes to modify the existing seawater once-through cooling intake structure by installing new traveling screens near the shoreline of the Moss Landing Harbor.
- The new units will use the existing Units 6 and 7 waste water discharge. This will require some onsite modifications to the out fall line.

In addition, Duke will be removing the large fuel storage tanks on site and adding Selective Catalytic Reduction (SCR; an air emission control technology) to existing Units 6 and 7. Monterey County is the lead agency for the environmental review of these projects, but the analysis in this document includes a discussion and analysis of any potential cumulative impacts from these projects.

If the project were to be approved by the Energy Commission, construction is expected to begin immediately after the decision and will take about 29 months. Full-scale commercial operation is expected by mid 2002. Duke Energy expects a peak work force of approximately 732 craft laborers, supervisory, support and construction management personnel on the site during construction. The capital cost of the project is estimated to be about \$475 million.

**PROJECT DESCRIPTION Figure 1
Regional Setting**

**PROJECT DESCRIPTION Figure 2
Local Setting**

NEED CONFORMANCE

Prior to January 1, 2000, the Public Resources Code prohibited the Energy Commission from certifying a power plant unless the Commission made a finding that the facility was found to be in conformance with the Commission's integrated assessment of the need for new resource additions. (Pub. Resources Code §§ 25523(f) and 25524(a).) The Public Resources Code directed the Commission to do an "integrated assessment of need," taking into account 5- and 12-year forecasts of electricity supply and demand, as well as various competing interests, and to adopt the assessment in a biennial electricity report.

On September 28, 1999, the Governor signed Senate Bill No. 110, which became Chapter 581, Statutes of 1999. This legislation repealed Public Resources Code sections 25523(f) and 25524(a) and amended other provisions relating to the assessment of need for new resources. It removed the requirement that the Commission make a specific finding that the proposed facility is in conformance with the adopted integrated assessment of need. Regarding need-determination, Senate Bill 110 states:

"Before the California electricity industry was restructured the regulated cost recovery framework for power plants justified requiring the commission to determine the need for new generation, and site only power plants for which need was established. Now that power plant owners are at risk to recover their investments, it is no longer appropriate to make this determination."

(Pub. Resources Code, § 25009, added by Stats. 1999, ch. 581, § 1.) Senate Bill 110 takes effect on January 1, 2000 (Cal. Const. Art. 4, § 8.). As of January 1, 2000, the Commission is no longer required to determine if a proposed project conforms with an integrated assessment of need. As a result, an application for certification for which the Commission adopts a final decision after January 1, 2000, is not subject to a finding of "need-conformance."

In this case, the Commission's final decision will be made after January 1, 2000. Therefore, because of SB 110, the Commission will make no finding of "need-conformance" with respect to the proposed project.

PUBLIC HEALTH

Testimony of Obed Odoemelum

INTRODUCTION

Operating the Moss Landing Power Plant (MLPP) as proposed by Duke Energy (the applicant), would create combustion products and possibly expose workers and the general public to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The issue of possible worker exposure is addressed in the **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 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 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, or toxic air pollutants. Those for which ambient air quality standards have been established are known as criteria pollutants. These criteria pollutants are identified in this section (along with regulations for their control) because of their 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. The impacts of the proposed project's criteria pollutants are 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. The Act required states to adopt plans to ensure compliance by 1982.

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 CARB’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) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered likely 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. The CARB and the air quality management districts are responsible for ensuring implementation of these requirements for new emission sources.

LOCAL

The Monterey Bay Unified Air Pollution Control District (MBUAPCD) has no specific rules implementing Health and Safety Code section 44300. However, it does require the results of a health risk assessment as part of the application for an Authority to Construct (ATC). MLPP has complied with this requirement.

MBUAPCD Rule 1000 (Permit Guidelines and Requirements for Sources Emitting Toxic Air Contaminants, TACs), requires the application of best available control technology to a new or modified source emitting TACs. It further requires that the excess cancer risk from the project’s carcinogenic emissions, as demonstrated through a risk assessment, not exceed 10 in one million and that the maximum increase in ambient 1-hour TAC concentrations of noncarcinogenic toxic emissions not exceed 1/420 th of the applicable permissible exposure limits (PELs). For a source of noncarcinogenic TACs, reasonable, available control technology must be applied. Furthermore, the maximum increase in ambient 1-hour TAC concentrations must not exceed 1/420 th of applicable PELs

SETTING

According to information from the applicant, (MLPP 1999 pages 1-5, and 6.16-2), the proposed project will be located within the existing MLPP in an area that includes industrial facilities, agricultural land, sparsely populated zones, recreational beaches and tidal wetlands. The project site is located in the vicinity of Moss Landing Harbor, which has a small, dispersed population of approximately 200. The nearest residence is located approximately 1,700 feet to the north. The applicant has provided a listing of facilities with sensitive receptors (such as children, the elderly, and the chronically ill) within the potential impact area (MLPP 1999 page 6.16-13). These sensitive receptors are usually more susceptible than the general population to the effects of environmental pollutants. Extra consideration is given to possible effects on these individuals in establishing exposure limits for environmental pollutants. The nearest of these facilities is a school, 2.3 miles to the north.

METHOD OF ANALYSIS

Any impacts from this type of project would be mainly associated with the toxic pollutants originating from the combustion of natural gas in turbines, ammonia from the selective catalytic reduction (SCR) system, and toxic chemicals from the cooling towers. Potential public exposure to the surrounding population is estimated through air dispersion modeling as described in the **Air Quality** section. After estimating the exposure levels, staff assesses whether these exposure estimates are below the applicable reference exposure levels used for evaluating effects, or below levels at which any possible cancer risks are considered significant by regulatory agencies in the case of cancer-causing (or carcinogenic) pollutants. The procedure for evaluating the potential for these cancer and noncancer health effects is known as a health risk assessment process and consists of the following steps:

- A hazard identification step in which the potential health effects of each pollutant of concern are identified;
- A dose-response assessment step in which the relationship 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 often the magnitude of the possible human health risk is assessed and presented for individual pollutants and for all toxic pollutants combined.

HEALTH EFFECTS ASSESSED

Health risks associated with a project can result from high-level exposure, which creates immediate-onset (acute) effects, or from prolonged low-level exposure, which creates chronic effects. Since noncancer effects are assumed to result after exposure above specific thresholds, an analysis of the potential for these effects will include consideration of background or ambient levels of the toxic pollutants being assessed. Unfortunately, such background measurements are not usually available

for the noncriteria pollutants associated with natural gas combustion unless there already are major sources in the area. Such pollutants are generally emitted at relatively low levels as compared to criteria pollutants. Environmental acceptability may also be assessed on a case-specific basis, in terms of relative contribution of project-related emissions to pollutant levels in the area.

For facilities such as the proposed MLPP, which burn natural gas, high-level exposure to toxic pollutants (which could cause acute effects), could occur only during major accidents. Such exposures are not expected from routine operations, when emissions are much lower. Therefore, long-term, chronic exposures are of greater concern than such potential short-term effects in assessing possible public health impacts. Chronic effects may be related to cancer or health effects other than cancer.

The method used by regulatory agencies to assess the significance of noncancer health effects is known as the hazard index method and is used to assess both acute and chronic effects. In this method, a hazard index is calculated for the individual pollutants by dividing the project-related exposure (estimated from dispersion modeling), by the reference level for that pollutant. This reference level is the exposure level below which impacts would not be expected. A hazard index of 1.0 or less suggests that acute or chronic effects would be unlikely. A value of more than 1.0 would suggest a likelihood of effects but does not demonstrate that such effects will occur. The indices for all pollutants are then added together to obtain an aggregate hazard index value for the project in question. A total index of 1.0 or less would suggest a lack of significant potential for effects from all pollutant exposures considered together. A value of more than 1.0 would suggest a significant potential for effects but does not demonstrate that such effects will occur. In such a case, any recommended regulatory actions would be based on further more refined analysis.

POTENTIAL CANCER RISK

Cancer caused by exposure to carcinogenic compounds usually results from biological effects at the molecular level. Since such effects are currently assumed possible from every exposure to a carcinogen, the risk of cancer is generally considered by staff and other regulatory agencies as more sensitive than the risk of noncancer health effects for assessing the environmental acceptability of a source of both carcinogens and noncarcinogens. This accounts for the high level of significance presently placed on theoretical cancer risk estimates in the environmental risk assessment process. For any source of concern, the potential risk of cancer is obtained by multiplying the exposure estimate by the potency values for the individual carcinogens involved. This potency value is established from available studies as an indicator of the relative ability of the carcinogen to cause cancer. The total project-related cancer risk is then obtained by adding together the risk values obtained for each of the individual carcinogens. This assessment process allows for calculation of only the upper bounds on the cancer risk. The actual risk will likely be lower and could indeed be zero.

STAFF'S SIGNIFICANCE CRITERIA

The Energy Commission staff considers a potential cancer risk of one in a million as representing a threshold below which carcinogenic exposures would be insignificant. Above this threshold, further mitigation could be recommended after proper consideration of issues related to the limitations of the assessment process. For noncarcinogenic pollutants, staff will consider significant health impacts 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 and may recommend mitigation after a more refined analysis.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION PHASE IMPACTS

Potential risks to public health during construction may be associated with toxic substances at the site that are disturbed during site preparation, and emissions from heavy construction equipment (MLPP 1999 Appendix 6.2-5). Potential impacts from emission of criteria pollutants from heavy equipment operation and particulates from site preparation are assessed in staff's **Air Quality** section in connection with the applicable air quality standards. That section also addresses compliance with applicable emission-limiting MBUAPCD rules together with the requisite conditions of certification.

Specific locations at the project site have been shown from site assessment surveys to be contaminated by specific contaminants from past industrial activities at the site (MLPP 1999 pages 6.14-1 through 6.14-4). As noted by the applicant (MLPP 1999 pages 6.14-1 through 6.14-4) and discussed in the **Waste Management** section, these contaminated locations will be remediated before construction, according to existing state requirements. Therefore, staff does not anticipate any pollutant-related public health impacts from the relatively short-term construction-related earth moving activities at the site. Effects from chronic exposures are usually not expected from these short-term activities.

DIRECT OPERATIONAL IMPACTS

The applicant conducted a health risk assessment for the project-related emissions of potential significance according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines for sources of this type. Results of this assessment have been provided to staff, along with documentation of the assumptions used (MLPP 1999 pages 6.2-23, 6.2-41, through 6.2-40, pages 6.2-58 through 6.2-60, pages 6.16-3 through 6.16-10, and Appendix 6.2-4). 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 accurate and concurs with the applicant's findings regarding 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 determine the potential for acute and chronic effects on body systems such as the liver, central nervous system, the immune system, kidneys, the reproductive system, the skin and the respiratory system.

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

A hazard index value of 0.05 was calculated for combined chronic health effects for the individual at the maximum impact location approximately 3.6 miles to the east of the project site. A value of 0.03 was calculated for combined acute health effects for an individual at the maximum impact location approximately 4.4 miles east-northeast of the site. These values are much below the 1.0 significance level suggesting that significant noncancer health effects would be unlikely during operations. These maximum impact levels are also below their significance thresholds as established under Rule 1000 of MBUAPCD.

The highest combined cancer risk was estimated to be 0.03 in a million for an individual at the same location identified for the total hazard index for chronic effects. This risk was calculated using existing procedures, which assume that the individual will be exposed at the highest possible levels to all the carcinogenic pollutants from the project for 70 years. This risk value is much below the one in a million level considered significant by staff regarding public exposure to environmental carcinogens.

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 emission levels beyond the point of maximum impact normally fall

within existing ambient background levels. Potentially significant cumulative impacts are only expected in situations where new sources are located adjacent to one other. Since no major sources of such pollutants are presently proposed for the immediate vicinity of MLPP, no cumulatively significant exposures are expected by staff for the project area.

PROJECT CLOSURE

As noted in the introduction to this section, this analysis is limited to the routine, project-related release of harmful substances into the environment. During either temporary or permanent facility closure, the major concern would be from accidental or nonroutine releases of either hazardous materials or wastes, which may be stored on site. These are discussed in the sections on **Hazardous Materials Management** and **Waste Management**, respectively. During temporary closures (of greater duration than associated with normal maintenance operations) routine release of hazardous materials would be unlikely since the project would not be operating. For permanent closure, the only routine emissions would be related to facility demolition or dismantling, such as exhaust from heavy equipment or fugitive dust emissions. These would be subject to conditions promulgated by the Energy Commission's Air Quality staff once a closure plan is received from the project owner.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has determined that the construction, operation and closure 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.

RECOMMENDATIONS

Since no significant public health impacts are considered likely by staff, no Public Health Conditions of Certification are proposed for the project.

REFERENCES

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

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.

Moss Landing Power Project (MLPP) 1999. Application for Certification (99-AFC-2). Submitted to the California Energy Commission, May 7, 1999.

WORKER SAFETY AND FIRE PROTECTION

Testimony of Kathi Hann

INTRODUCTION

Worker safety and fire protection is legislated 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 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 worker safety and fire protection measures proposed by Duke Energy Moss Landing LLC for the Moss Landing Power Plant (MLPP) Project. Although not included in the AFC for Moss Landing, activities associated with the demolition of existing, unused, fuel oil storage tanks and the Selective Catalytic Reduction (SCR) Installation are included in this analysis. These activities are also reviewed and permitted by the Monterey County Planning Department, consistent with the North County Land Use Plan Policy 5.2.2.

Staff has reviewed both the original Application for Certification (May, 1999) and the November 22, 1999 AFC Supplementary Filing (Change in Project Description; Air Quality Increments & Cumulative Impacts Analysis; and Response to Additional California Coastal Commission Follow Up Questions) to determine whether MLPP 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 features of the project comply with applicable LORS and do not present unusual industrial safety or fire protection problems. Issues relating to the project's impacts to local fire protection service capabilities and appropriate mitigation have not yet been resolved and are addressed under proposed conditions 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 Prevent 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

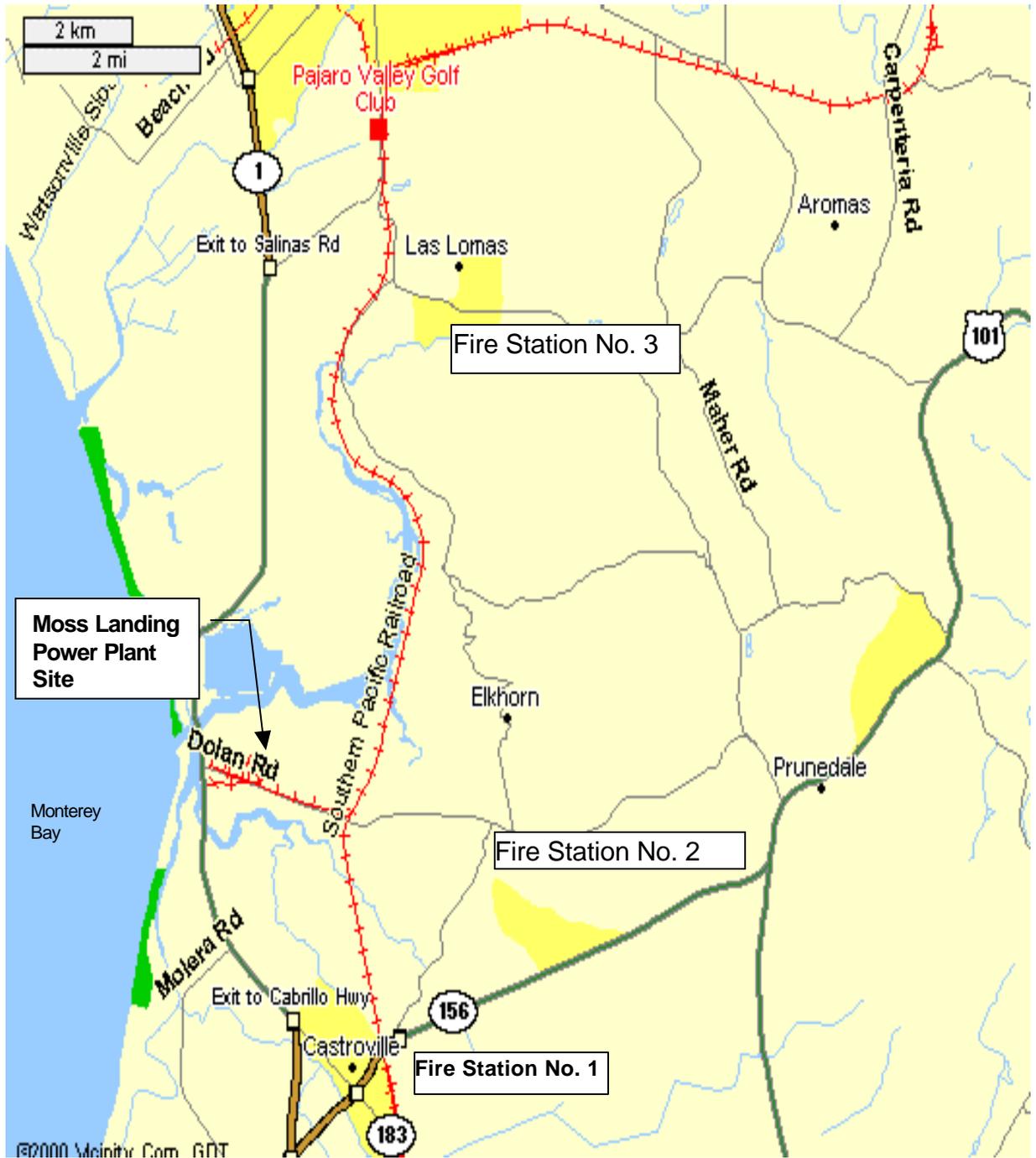
The existing MLPP facility is located 12 miles northwest of Salinas, California in Monterey County. The authority having jurisdiction for fire support services for the MLPP and vicinity is the North County Fire Protection District (NCFPD). The AFC incorrectly states that the Monterey County Fire Department provides fire protection for the MLPP. NCFPD Station One is located in Castroville, about 3 miles southeast of the Project is the closest station to the MLPP site and would provide initial emergency response. Station Three in Las Lomas would provide back-up support. See Worker Safety Figure 1.

These two fire stations have first responder HAZMAT capabilities (Pereira, 2000). "First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property or the environment from the effects of the release" (Title 29 of the Code of Federal Regulations, Section 1910.120)."

WORKER SAFETY Table 1 provides an outline of the equipment and personnel at each station. Following is a general description of the response equipment listed:

- 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 heavy stream appliance. This apparatus also has Basic Life Support (BLS) medical treatment capabilities.
- An aerial Fire Truck is also a primary a response units (also known as Quints). It has a minimum 500-gallon water tank, a 1,250-gpm pump, 1,000 feet of hose and an aerial ladder with stream capability of 1,000 gpm.

WORKER SAFETY AND FIRE PROTECTION Figure 1
Moss Landing Power Plant – Fire Station Locations



- A Type III fire engine is primarily used for fighting wildland fires. It has a minimum 300-gallon water tanks, a minimum of 120-gpm pump, 1000 feet of 1 ½ “ hose, and 800 feet of 1” hose and usually comes with 4-wheel drive capability.
- A Water Tender has a 1,250-gallon water supply, a 500-gpm pump, and an auxiliary 2,000-gallon folding tank.
- Rescue Truck has increased medical aid capabilities, depending upon the department. Usually it also carries advanced vehicle extraction and rope rescue equipment.

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

Station	Response time	Equipment	Number of Firefighters
North County Fire District Station One 11200 Speegle Street Castroville, CA 95012 (831) 633-2578	3 miles southeast from project site. Estimated response time: 4– 6 minutes	3 – Type I Engines 1 – Water tender 1 – Rescue vehicles 1 – Type III Engine 1 – Utility pick-up	6
North County Fire District Station Two 17639 Pesante Road Prunedale, CA 93907	8 miles west from project site. Estimated response time: 9–11 minutes	2 – Type I Engines 1 – Type III Engine 1 – Utility pick-up	6
North County Fire District Station Three 301 Elkhorn Road Las Lomas, CA 95076	7 miles west from project site. Estimated response time: 8–10 minutes	2 – Type I Engines 1 – Type III Engine 1 – Water Tender 1 – Utility pick-up	6

IMPACTS

PROJECT SPECIFIC IMPACTS

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (Section 6.10.1.7 Emergency and Other Services), to determine if the project would adequately protect workers and if it would impact the fire protection services in the area. The project will rely on both onsite fire protection systems and local fire protection services.

The information in the AFC indicates that the existing fire protection system at the site will support the Project. In includes fixed water fire suppression systems, fire

hose stations, hydrants, portable fire extinguishers, detection and control systems, and other equipment. The system is designed and operated in accordance with National Fire Protection Association standards and recommendations. The Project will be connected to the existing MLPP fire protection system. Onsite water storage consists of two (2) water storage tanks with a multiple series fire pump system. The tank capacities are 250,000 and 750,000 for a total of 1,000,000 gallons. Written comments received by NCFPD (Chief Pereira, 2000) indicate that the proposed location of the new combined cycle units indicates the need to remove and add hydrants to the existing fire protection system. Therefore, MLPPP will need to forward plans of the existing underground water system, with proposed changes identified, to the District for review and approval. This requirement is specified in staff's recommended condition of certification **WORKER SAFETY-3**. With this change, the District agrees that the existing fire protection system at the site will be adequate for fighting incipient fires (Pereira, January 10, 2000).

Additional comments from NCFPD indicate that there is a deficiency in Initial Attack capabilities for the MLPP. This deficiency is identified as "the lack of elevated stream fire suppression and rescue capabilities by the first responding staffed equipment of the Fire District." The applicant's schematic (figure 2-6) and dimensions (figure 2-7) indicate a 69-70 foot tall structure that is approximately 23 feet wide. The total length of the combined cycle unit is estimated at 155 feet minimum. The combined cycle units will be back to back for total minimum length of 300 feet. The Fire District does not have a ladder truck in its inventory, and this capability is only available on a mutual aid request and would be predicated upon another agency staffing or having available a staffed ladder truck.

Therefore, due to the lack of a ladder truck, NCFPD does not have elevated stream fire suppression and rescue capabilities required for the Project. Prior to construction of the MLPP modifications, the project owners will reach an agreement with NCFPD on the fees and payment for a 75-foot minimum Quint Aerial ladder truck and staffing of personnel for the truck. Please refer to conditions of certification **WORKER SAFETY-4**.

WORKER SAFETY

Industrial environments are potentially dangerous. Workers are exposed to chemical spills, hazardous waste, fires, moving equipment, and confined space entry and egress problems. It is important for MLPP to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers.

In accordance with deregulation of the electricity industry in California and the sale of power generation facilities from regulated utilities to private entities, the California legislature passed Assembly Bill (AB) 1890. In accordance with AB 1890, for purposes of safety and reliability, new owners of electrical generating facilities are required to contract back to the previous operator for facility operations and maintenance (O&M) for 2 years from the date of closing the sale of the facility. As a result, Duke Energy has contracted O&M with PG&E for the period July 1, 1998,

through June 2000. Duke Energy will be responsible for providing O&M personnel beginning July 1, 2000.

During this O&M period, in regard to worker safety, PG&E is responsible for its employees, and Duke Energy is responsible for its employees. At the conclusion of the O&M period, Duke Energy will be responsible for all MLPP employees.

The existing health and safety policies in effect at MLPP include provisions for ongoing operations, including incidental construction activities, and address safety programs, personal protection equipment and fire suppression.

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

The Moss Landing Power Plant project encompasses installation of two combined-cycle units plus installation of four exhaust stacks, and removal of eight existing 225-foot stacks formerly used for Units 1-5. In addition to the new combined-cycle units, the Project also included the upgrade of existing Units 6 and 7. Workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

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:

- 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 Moss Landing facility, detailed programs and plans will be provided 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. Operations Safety and Health Program was prepared pursuant to regulatory requirements of Title 8 of the California Code of Regulations. Moss Landing Power Plant's Operation Safety and Health Program includes 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:

- 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 plan 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 MLPP modifications, detailed programs and plans will be provided pursuant to the condition of certification **WORKER SAFETY-2**.

SAFETY AND HEALTH PROGRAM ELEMENTS

MLPP provided the proposed outlines for a Construction Safety and Health Program. The Operation Safety and Health Program is currently in effect at the facility. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:

INJURY AND ILLNESS PREVENTION PROGRAM (IIPP)

MLPP 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 MLPP'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/OHA an opportunity to evaluate MLPP's IIPP in conjunction with the activities occurring on site.

EMERGENCY ACTION PLAN

California regulations require an Emergency Action Plan (8 CCR § 3220). Volume II of the Business Plan/Contingency Plan is the existing Facility Emergency Response (FEP) (PG&E). It provides 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 MLPP to submit a final Operation's Emergency Action Plan to Cal/OSHA for review and comment after an on-site consultation. Staff also proposes that MLPP submit the latest revision to the Emergency Action Plan to the NCFPD for review and approval to satisfy proposed conditions of certification **WORKER SAFETY 1** and **2**.

FIRE PREVENTION PLAN

California Code of Regulations requires an Operation Fire Prevention Plan (8 CCR § 3221). The AFC did not contain a proposed fire prevention plan. 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 MLPP submit a copy of the Fire Prevention Plan to the California Energy Commission Compliance Project Manager (CPM) and the NCFPD 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). MLPP's operational environment will likely require PPE.

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

The components of MLPP's program as outlined include:

- Personal Protective Equipment Policy – Presents safety procedures regarding respiratory protection, eye protection, footwear and head protection. In 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. In covers numerous types of eye and face protection, respective fit, inspection and care.

Staff evaluated MLPP'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". During the AB 1890 mandated O&M period, work at MLPP is performed in accordance with the PG&E Code of Safe Work Practices. Following completion of the O&M period, the Duke Energy Code of Safe Work Practices manual will be in effect, and will be made available to each employee. This manual covers basic job safety practices and contains both general and task-specific work practices. In addition to safe work practices, various existing health and safety policies are in effect at MLPP. Examples are presented in the following paragraphs.

Safety Action Plan for Contractors

Serves as a guide for contractors to follow in developing their individual safety programs as required by CalOSHA.

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 or flammable contaminants (8 CCR Sections 5156-5168). Confined spaces include silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins and pits. MLPP 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

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

Provides employees an opportunity to identify safety problems and recommend appropriate hazard controls to the Plant Manager. 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 MLPP provides 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 MLPP project could result in impacts on the fire and emergency service capabilities of the District. Staff has received written comments from the NCFPD detailing the fire protection equipment and services required for the facilities. Staff will hold meetings with District representatives to discuss their concerns and provide an analysis of their mitigation requirements in the Final Staff Assessment.

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 during that time.

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

If MLPP provides a Construction Safety and Health Plan, and an Operation Safety and Health Plan, as required by conditions of certification **WORKER SAFETY 1, 2, and 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 MLPP will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

PROPOSED CONDITIONS OF CERTIFICATION

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 North County Fire Protection District (NCFPD) 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 NCFPD 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 NCFPD 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 North County Fire Protection District 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 submit plans of the existing underground water system, including proposed changes, to the North County Fire Protection District for review and approval.

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 letter from the North County Fire Protection District stating that they have received, reviewed and approved the plans of the existing underground water system with proposed changes

WORKER SAFETY- 4 The project owners shall reach an agreement with the North County Fire Protection District on the fees and payment for a 75-foot minimum Quint Aerial ladder truck and staffing of personnel for the truck or other alternative equipment/measures agreeable to the North County Fire Project Division and the project owner.

Verification: Not later than 30 days prior to any ground disturbance, the project owner shall provide the CPM with a copy of an agreement with the North County Fire Protection District and the owners of the project relative to the agreed-upon fees and payment for the truck and staffing.

REFERENCES

- Cal/OSHA Consultation. 1990. Cal/OSHA Consultation Pamphlet.
- Pereira, Mark, Fire Chief North County Fire Protection District . Personnel communication with Terri Wallace regarding review of applicant's offsite fire protection. December 14, 1999.
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- Pereira, Mark, Fire Chief North County Fire Protection District. Fax to Terri Wallace regarding copies of local Planning and Building permit conditions. January 10, 2000.
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- Moss Landing Power Plant Project. 1999b. Application for Certification, Supplement AFC Filing on: Changes in Project Description; Air Quality Increments & Cumulative Impacts Analysis; & Responses to Additional California Coastal Commission Follow Up Questions. MLPP Project (99-AFC-4) Submitted to the CEC, October 1, 1999.

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam

INTRODUCTION

Duke Energy's proposed modification and improvement of the existing Moss Landing Power Plant will allow the use of the existing transmission system without modification to its constituent lines with regard to voltage, conductor configuration or support structures. The only change to this existing system would be the flow of the additional energy generated from the modified power plant, the Moss Landing Power Project (MLPP). Since magnetic fields are produced during current flow, this added energy would add to the level of magnetic fields in the existing system. The purpose of this analysis is to assess the need for line modifications to reduce the fields from the post-modification system along with their related impacts, which depend on the magnitude of such fields. This assessment will be made by comparing the fields in the post-modification period with fields from lines of the same current-carrying capacity which were designed according to existing laws, ordinances regulations and standards (LORS). Staff's analysis will focus on the issues noted below which relate primarily to the physical presence of each line, or secondarily to the physical interactions of its 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.

If staff finds that operation of the lines as proposed for this project will produce fields and related impacts at levels comparable to similar lines that were designed according to applicable LORS, we will recommend that no further action be required to reduce impacts; if not, we will recommend mitigation.

LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Discussed below by subject area are design-related federal or state LORS and industry standards and practices applicable to the physical impacts of transmission lines as proposed for use in connection with MLPP. There presently are no local laws or regulations specifically applicable to 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 portion proposed to directly connect the proposed MLPP to the existing PG&E transmission grid. 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 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 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 both as EMF exposure. As noted by the applicant (MLPP 1999 pages 6.18-7 and 6.18-8), the available evidence as evaluated by CPUC and other regulatory agencies has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, 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 in connection with new or modified lines. It required PG&E and the other utilities within its jurisdiction to establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. This means that all lines to be used in connection with the proposed MLPP will have to meet the design requirements specified by PG&E for their service area. The CPUC further established specific limits on the resources to be used for each new or upgraded line with regard to

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

In keeping with this CPUC policy, the Energy Commission staff requires evidence that each proposed line will be designed or upgraded 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 or modified line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, its fields are required under existing CPUC policies to be similar, in terms of intensity, 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 as necessary.

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 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, Montana, New Jersey, and New York) 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. 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

According to information from the applicant (MLPP 1999, pages 6.18-1 through 6.18-3), the power from the existing Moss Landing Power Plant is presently transmitted to the PG&E Moss Landing Switchyard adjacent to the plant. This switchyard is an electric power distribution center from which power is transmitted to the PG&E transmission grid through a series of long transmission lines extending to at least 12 regional substations in this part of the PG&E service area. These substations also receive electric power from other power stations in California and provide electric power to communities in their general vicinity, as discussed by the applicant. These lines are owned and maintained by PG&E and are to be used, without modification, for the modified power plant.

PROJECT DESCRIPTION

The applicant has provided a detailed listing of the eight existing system 115kV, 230 kV and 500 kV power lines through which the MLPP-generated power will be transmitted. The applicant has also detailed the specific communities served by each line, some of which have been operational for up to 45 years (MLPP 1999 pages 6.18-2 and 6.18-3). The lengths of these lines (from the PG&E Moss Landing Switchyard to the regional substations) range from 14 miles to 70 miles. As is current practice, the power in the post-modification phase will be transmitted in each line at levels that will depend on prevailing need conditions throughout the grid. These lines are located within separate rights-of-way in some areas but share the same rights-of-way with nearby lines in other areas (MLPP 1999 pages 6.18-6 and 6.18-7). They are typically supported by 100 to 150-foot towers as typical of similar lines in the PG&E service area.

IMPACTS

GENERAL IMPACTS

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 is up to each project proponent to apply such measures (to each new or upgraded line) to the extent appropriate for the geographic area involved. It is such field-reducing measures that staff would recommend for this project if we were to find them to be higher than levels we consider appropriate for such lines. The potential for each type of impact is assessed separately for each proposed project.

PROJECT SPECIFIC IMPACTS

IMPACTS FROM PHYSICAL PRESENCE

Staff has assumed that the lines in the existing PG&E transmission system (to be used for this project) were designed according to the previously noted PG&E's design guidelines required under present CPUC policy. Since PG&E established the physical dimensions and conductor configurations of these lines according to their designs bearing on aviation safety, fire hazards, and hazardous shocks, staff considers the use of these lines in the post-modification era to be safe with regard to these impacts.

ELECTRIC FIELD EFFECTS

The potential for electric field-related audible noise, nuisance shocks and interference with radio-frequency communication depends on electric field levels which, in turn, depend on line voltage. Since (a) there will be no change in the voltage of the existing lines and (b) these lines were designed and are presently maintained by PG&E according to PG&E requirements bearing on these electric field effects, staff considers their proposed use in the post-modification era to be appropriate with regard to these electric field effects.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

It is fields from these existing lines that humans will be exposed to along their respective routes. The applicant calculated the maximum electric and magnetic field strengths possible along the existing routes (of between 14 miles and 70 miles) for the system lines that will be affected by the increased power generation at the proposed project (MLPP 1999 page 6.18-7). Staff has verified the accuracy of the applicant's calculations with regard to factors bearing on field strength and exposure assessment. In their calculations, the application obtained electric field strengths for the existing and post-modification conditions along these routes as a way to demonstrate that these fields will not change in the absence of changes in existing voltages. These calculated values range from 0.15 kV/m to 2.18 kV/m at the edge

of the rights-of-way. The maximum value within the right of way is 7.06kV/m. These values are typical of existing PG&E lines of similar voltage.

To assess the project-related increments in magnetic field exposure, magnetic field levels were calculated by the applicant for the existing and post-modification power flow conditions. Existing magnetic fields were calculated to range from 0.3 mG to 45 mG at the edge of the right-of-way. The maximum value within the rights-of-way is 150.2 mG. Maximum fields for the post-modification period range from 2.3 mG to 63.8 mG at the edge of the rights-of-way and from 20.5 mG to 194 mG within the rights-of-way. These field strength increments are as expected in PG&E-designed lines for the increased current flow associated with the plant modification proposed. The calculated maximum values for the post-modification period are within the range associated with PG&E lines of similar voltage and current-carrying capacity. These values as further noted by the applicant (MLPP 1999 page 6.18-10), are within the average range of 150 mG to 250 mG established for transmission lines by the states with regulatory limits.

CUMULATIVE IMPACTS

The strengths of electric and magnetic fields from any proposed line are usually calculated to factor in the interactive effects of fields from nearby lines. The fields calculated to assess the impacts of the modified Moss Landing Plant, reflect the interactive effects of fields from the individual lines that constitute the existing transmission system as it extends from the project site to area substations. Exposures along the route would reflect any cumulative field impacts on exposed humans. Since no separate transmission system is proposed in connection with the proposed modification project, these calculated field values reflect all system exposures of a cumulative nature. As reflected in the calculated values, any such exposures would be similar to exposures associated with similar systems within the PG&E service area.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for lines such as those to be used for MLPP, the public health significance of any existing or post-modification field exposure cannot be characterized with certainty. However, the available evidence, as previously noted, has not established that these lines pose a significant health risk to humans at normally encountered levels. Although the additional current from the proposed MLPP will increase the magnetic fields within some of the lines in the existing transmission grid, the calculated field strengths suggest that exposure to these fields would be within the range typical of PG&E lines of the same voltage and current-carrying capacity. The potential for nuisance shocks and other field-related impacts will continue to be minimized through current PG&E practices which reflect compliance with GO-90 and Title 8, Section 2700 et seq. of the California Code of Regulations. Since these lines were designed according to PG&E requirements for preventing

aviation hazards, staff considers their continued use in the post-modification period to be safe in this regard.

RECOMMENDATIONS

Since (a) the modified Moss Landing Power Project is proposed to be operated without significant modifications to the existing transmission system and (b) the project's operation will result in magnetic field exposure within ranges typical of similar PG&E transmission systems, staff recommends the use of the existing transmission system in the post-modification era, without additional modifications. Staff recommends the following conditions of certification to verify the accuracy of the applicants assumptions with respect to post-modification magnetic field strengths.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall engage a qualified consultant to measure the strengths of line electric and magnetic fields at the points along the routes for which estimates were provided by the applicant

Verification: The project owner shall file copies of the pre-and post-energization measurements after the project is operational and within 60 days after the measurements are completed.

REFERENCES

Moss Landing Power Project (MLPP 1999). Application for Certification, (99-AFC-2). Submitted to the California Energy Commission, March 3, 1999.

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

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 Moss Landing Power Plant Project (MLPPP) (Duke Energy, 1999a) 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, in exchange for compensation, accept a higher level of risk than would be acceptable for general public exposure. Workers are therefore 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 MLPPP 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. Analysis of the potential for impact associated with aqueous ammonia deliveries is addressed in staff's **Traffic and Transportation** analysis.

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 relatively low toxicity, and/or their low environmental mobility. Although no natural gas is stored, the project will also involve the construction and operation of short natural gas pipeline connections and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion.

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 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 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 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 (Duke Energy, 1999a, AFC Chapter 6.2). This data indicates that wind speeds below one meter per second and temperatures exceeding 100°F can occur in the project area. Therefore, staff suggested that the applicant use 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. These conditions were reflected in the

modeling used to 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 facility property. Thus, elevated terrain is not an important factor affecting the modeled results.

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. The nearest sensitive receptor location is about 2.3 miles from the proposed facility and the nearest residence is 2350 feet from the facility (Duke Energy, 1999a).

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 (NO_x) 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. Staff may, based on such analysis, determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

Section 6.15 of the AFC included a discussion of the results of modeling for a worst case accidental release of aqueous ammonia. The worst-case release scenario is associated with a postulated spontaneous catastrophic storage tank failure. In conducting this analysis, it was assumed that spilled material would be contained in the covered basin below the storage vessel and 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. Staff evaluated the model used, the assumptions leading to model inputs and the results of the modeling. Based on this staff concurs with the approach and the results. This analysis indicated that concentrations exceeding 75 PPM would be confined almost completely to the project site and would not affect any public receptor.

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, so no cumulative impacts are possible.

FACILITY CLOSURE

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site regardless of facility closure. 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, Monterey County Department of 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 MLPPP is adequate to reduce the potential risk of public health impacts associated with accidental hazardous materials accidents to insignificant levels. However, staff proposes a condition (Haz-3) requiring development of a safety management plan for delivery of aqueous ammonia, since the MLPPP is not 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.

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 may be required to develop an RMP.¹ The RMP, if required by the Monterey County Department of Health, will be submitted to EPA, the Monterey County Department of Health, and Energy Commission staff for evaluation. To insure adequacy of the RMP, staff's proposed conditions of certification require that the RMP, if required, be submitted for concurrent review by EPA, the Monterey County department of Health, and staff. In addition, staff's proposed conditions of certification also require Monterey 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.

¹ At present, it appears unlikely that an RMP will be required.

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 provide a Risk Management Plan to the Monterey County Department of Health and the CPM for review at the time the plans are first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall reflect all recommendations of the Monterey County Department of Health and the CPM in the final document. A copy of the final plans, reflecting all comments, shall be provided to Monterey County and the CPM once approved by EPA.

Verification: At least sixty (60) days prior to the delivery of aqueous ammonia to the MLPP project the owner shall provide the final plans, listed above and accepted by Monterey County, to the CPM for approval.

HAZ-3 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 facility, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

HAZ-4 The aqueous ammonia storage tanks shall be constructed to specifications at least as protective as those in American Petroleum Institute (API) 620. The secondary containment will be designed and operated to hold the volume of precipitation from a 24-hour, 25-year storm event plus 100 percent of the capacity of the largest tank within its boundary.

Verification: At least 60 days prior to delivery of aqueous ammonia to the site, 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.

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HAZARDOUS MATERIAL MANAGEMENT Appendix A

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 to 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

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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 6.15-3 from the AFC (Duke Energy, 1999a)]

WASTE MANAGEMENT

Testimony of Michael Ringer

INTRODUCTION

This analysis presents an assessment of issues associated with managing wastes generated from constructing and operating the proposed Moss Landing Power Plant Project (MLPPP). 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 nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation, except wastewater discharged pursuant to National Pollutant Discharge Elimination System (NPDES) permits. Wastewater is discussed in the **Soil and Water Resources** section of this document.

Energy Commission staff's objectives 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. § 6922)

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, and
- Submission of periodic reports to the EPA or authorized state.

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, and specific types of wastes are listed.

STATE

CALIFORNIA HEALTH AND SAFETY CODE §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 (DTSC) 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, § 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, §66262.10 ET SEQ. (GENERATOR STANDARDS)

These sections establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, hazardous waste must only be handled by registered hazardous waste transporters. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

LOCAL

There are no local LORS to be considered.

SETTING

PROJECT AND SITE DESCRIPTION

The Project consists of replacing generating units 1 through 5 of the existing Moss Landing Power Plant (MLPP) with two 530 megawatt (MW) combined cycle generating units. The MLPP is an industrial complex with seven generating units, fuel oil storage tanks, seawater inlet and outfall structures, warehouse and office buildings, and other related equipment.

In 1998, Duke Energy purchased the MLPP facility from Pacific Gas and Electric (PG&E), but PG&E retained responsibility for cleaning up onsite contamination created prior to the sale. PG&E commissioned a Phase I Environmental Site Assessment (ESA) at MLPP in April, 1997 (Duke Energy 1999a, AFC p. 6.14-1). The purpose of the ESA was to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities. The Phase I ESA identified a number of environmental conditions at the site, including petroleum hydrocarbons and metals in soils near the fuel oil storage tanks, residual levels of insulating oils containing polychlorinated biphenyls within the switchyards (since remediated), and chromium exceeding background levels in a monitoring well (Duke Energy 1999a, AFC p. 6.14-2).

The Phase I ESA provided the basis for additional sampling and analysis of soil and groundwater performed as part of a Phase II ESA to further define the extent of existing contamination (Duke Energy 1999a, AFC p. 6.14-2). Analytical results of the Phase II investigation helped identify the following four potential remediation issues for identified localized areas at the MLPP (Duke Energy 1999, AFC p. 6.14-3):

- Volatile organic compounds (VOCs) in ground water above applicable maximum contaminant levels (MCLs)
- Chromium in ground water above MCLs
- Petroleum hydrocarbons in groundwater exceeding a threshold concentration of 100 micrograms/liter
- Petroleum hydrocarbons in soil in concentrations exceeding 100 milligrams per kilogram

As noted above, PG&E is responsible for remediating existing contamination at the MLPP site. Pursuant to California Health and Safety Code section 25260 et seq., PG&E requested the designation of an administering agency to oversee site investigation and remedial action at the site. On April 30, 1998, the Site Designation Committee designated DTSC the administering agency (Resolution No. 98-05). As such, it is DTSC's responsibility to administer all state and local laws that govern site cleanup, determine the adequacy and extent of cleanup, and issue necessary authorizations and permits. DTSC has reviewed MLPP's plans for hazardous waste handling and site remediation and has informed Energy Commission staff that it does not have any concerns or comments (DTSC 2000). Following the determination that an approved remedy has been accomplished, DTSC will also issue a certificate of completion.

Currently, DTSC, the Regional Water Quality Control Board, and Monterey County are reviewing detailed site investigation documents, and PG&E is awaiting comments. PG&E has issued a report that discusses remediation issues at the site and provides the following recommendations for additional focused investigations for various contaminants (Levine-Fricke 1999):

VOLATILE ORGANIC COMPOUNDS IN THE VICINITY OF THE TECHNICIAN SHOP (NORTH OF UNITS 6 AND 7)

- Trimethylbenzenes and other aromatic compounds were not detected in subsurface soil samples or groundwater samples. Therefore, they are not considered to be of concern and are not addressed in recommendations for additional work.
- Additional soil samples should be collected to characterize the lateral and vertical extent of VOCs in soil near the south end of the shop.
- An additional groundwater investigation should be conducted to provide data for characterizing the extent of VOCs. Data from this investigation will provide a basis for determining the locations of future monitoring well locations as necessary.

VOLATILE ORGANIC COMPOUNDS IN THE VICINITY OF THE PAINT YARD AND THE HAZARDOUS MATERIALS STORAGE BUILDING (EAST OF UNITS 4 AND 5)

- A risk assessment based on the Phase II ESA indicates that remediation of VOCs in the soil and groundwater is not necessary.
- Groundwater samples from existing monitoring wells in the area should be collected to monitor current conditions and confirm the conclusions.

VOLATILE ORGANIC COMPOUNDS IN THE CONSTRUCTION WASTE LANDFILL AREA (CENTRAL AREA OF MLPP)

- A risk assessment based on the Phase II ESA indicates that remediation of VOCs in soil and groundwater is not necessary.
- Additional water level measurements should be collected from all site monitoring wells to provide groundwater elevation and flow direction data.
- Groundwater samples from existing monitoring wells should be collected to provide a basis for determining the locations of further monitoring wells.

PETROLEUM HYDROCARBONS IN SOIL AND GROUNDWATER

- Additional groundwater samples from all existing monitoring wells should be collected to determine the current extent of total petroleum hydrocarbons in groundwater and to evaluate any changes when compared to data collected during the Phase II ESA.
- Additional soil and groundwater data in the western area near the shoreline at Moss Landing Harbor should be collected to better characterize the presence of petroleum hydrocarbons there.
- Soil and groundwater samples from beneath the fuel storage tanks should be collected upon their decommissioning to assess whether fuel potentially released from tanks and associated piping has affected soil or groundwater quality.

POLYNUCLEAR AROMATIC HYDROCARBONS IN SOIL AND GROUNDWATER

- A sitewide survey will be conducted to map the types of ground coverings to confirm the association of polynuclear aromatic hydrocarbons (PAHs) with asphalt and other ground-surfacing products.
- Additional groundwater samples from all existing monitoring wells should be collected for PAH analysis to provide current information.
- Soil and groundwater samples from beneath the fuel storage tanks should be collected upon their decommissioning and assessed for PAHs.

METALS IN SOIL AND GROUNDWATER

- A risk assessment based on the Phase II ESA indicates that remediation of metals in soil and groundwater is not necessary.
- Additional soil and groundwater sampling may be recommended if underground piping associated with the metal cleaning waste surface impoundments is found to exist and determined to be a potential source of metals.

CHROMIUM IN SOIL AND GROUNDWATER

- A risk assessment based on the Phase II ESA indicates that remediation of total and hexavalent chromium in soil and groundwater is not necessary based on the range and distribution of hexavalent chromium concentrations.
- Additional groundwater samples from existing monitoring wells will be collected to obtain data about current site conditions and resolve discrepancies in past data.
- In conjunction with proposed sampling, certain parameters will be measured to evaluate whether natural attenuation processes are active in the area. Groundwater sampling may be recommended to confirm the vertical extent of chromium-affected groundwater.
- Additional soil and groundwater sampling may be recommended if underground piping associated with the metal cleaning waste surface impoundments is found to exist and determined to be a potential source of chromium.
- The groundwater monitoring program will provide updated status of VOCs and chromium groundwater plumes in the vicinity of Units 6 and 7 near the alignment of the cooling intake and discharge pipes. The only contamination detected in the vicinity of the powerplant footprint consists of low levels of heavy grade hydrocarbons in shallow subsurface soils which will be remediated by PG&E prior to initiation of power plant construction.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION

Site preparation and construction of the generating plant and associated facilities will generate both nonhazardous and hazardous wastes. Individual contractors are considered to be the generators of construction wastes, and as part of its contract specifications for construction contractors, Duke Energy will require that materials be handled and disposed in accordance with applicable LORS (Duke Energy 1999a, AFC p. 6.14-9).

Nonhazardous waste streams from construction include paper, wood, glass, scrap metal, and plastics, from packing materials, waste lumber, insulation, and nonhazardous chemical containers. Duke Energy estimates that about 40 cubic yards of these types of wastes will be generated on a weekly basis, or a total of about 4300 cubic yards during construction (Duke Energy 1999d, Revised Table 6.14-4).

Hazardous wastes typically generated during construction include waste oil and grease, paint, used batteries, spent solvent, welding materials, and cleanup materials from spills of hazardous substances. Revised Table 6.14-4 (Duke Energy 1999d) lists types, estimated amounts, and management methods of hazardous wastes. Duke Energy estimates that a total of about 100 cubic yards of empty hazardous material containers will be generated, although these may be classified as nonhazardous if they are emptied and managed according to specified methods (22CCR§66261.7). Additionally, about 1200 gallons of solvents, used oil, paints, and oily rags will be generated.

In addition to the construction hazardous wastes noted above, there will be additional wastes associated with the demolition of eight 225 foot tall exhaust stacks formerly used for units one through five. Material from demolition of the exhaust stacks may include both hazardous and nonhazardous wastes, depending on analytical results. Portions classified as hazardous would be transported offsite to a Class I (hazardous) disposal facility. Duke Energy estimates that about 500 cubic yards per week of demolition debris from the stacks could be generated, or a total of about 8700 cubic yards over the course of demolition (Duke Energy 1999d, Revised Table 6.14-4).

The project will also include improvements to the cooling water intake structure for units one through five. As part of these activities, collected sediment may have to be removed from the front of the structure. Any silt or related dredge material that is removed will be tested and disposed of in an approved inland disposal facility (Hoffman 1999). The work associated with this activity will encompass an area of less than one-quarter acre, so significant amounts of dredge material are not anticipated to require inland disposal.

OPERATION

The proposed facility will generate both nonhazardous and hazardous wastes under normal operating conditions.

Nonhazardous wastes generated during plant operation include trash, office wastes, empty containers, broken or used parts, used packing material, and used filters.

The quantities of nonhazardous wastes generated from gas-fired facilities are typically minor. Operation of the new combined cycle units is expected to generate about 500 cubic yards of such nonhazardous solid waste on an annual basis (Duke Energy 1999d, Revised Table 6.14-2). Nonhazardous solid waste at MLPP is routinely segregated according to recyclable content to minimize the quantity disposed offsite (Duke Energy 1999a, AFC p. 6.14-5).

Hazardous wastes likely to be generated during routine project operation include spent air pollution control catalysts, used oil and filters, used cleaning solvents, used batteries, and filter press solids. About 3500 gallons of waste oil and 100 tons of hazardous solids are expected to be generated on an annual basis from the new combined cycle units (Duke Energy 1999d, Revised Table 6.14-2). Waste oil is transported offsite to licensed recyclers (Duke Energy 1999a, AFC p. 6.14-7) and hazardous solids are disposed of at various locations, depending on the waste type (Id.).

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

AFC Table 6.14-3 lists landfills in Monterey County which accept nonhazardous wastes. Solid waste currently generated by MLPP is taken to the Marina Landfill which is operated by the Monterey Regional Waste Management District (Duke Energy 1999a, AFC p. 6.14-5). The Marina Landfill has a permitted disposal capacity of 1200 tons per day and is expected to remain operational until 2090. Project nonhazardous waste generation will be less than 40 tons per week during construction and less than 10 tons per week during operation. Thus, waste generation rates are only a small portion of daily permitted capacity. Even discounting the effects of recycling on the total amount of non-hazardous wastes destined for landfilling, the amounts of waste generated during project construction and operation are insignificant relative to existing disposal capacity.

Three Class I landfills in California, at Kettleman Hills in King's County, Buttonwillow in Ken County, and Westmoreland in Imperial County, are permitted to accept hazardous waste. In total, there is in excess of twenty million cubic yards of remaining hazardous waste disposal capacity at these landfills, with remaining operating lifetimes up to 90 years. The amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law, but not federal law.

Much of the hazardous waste generated during facility construction and operation will be recycled, such as used oil and spent catalysts. Even without recycling, the generation of hazardous waste from MLPP would be a very small fraction (less than

one percent) of existing capacity and not significantly impact the capacity or remaining life of any of the state's Class I landfills.

CUMULATIVE IMPACTS

Additional waste management impacts which could contribute to those from construction and operation of the MLPP project include those associated with continued operation of units six and seven at MLPP, demolition of existing fuel oil storage tanks with related environmental remediation, and installation of selective catalytic reduction (SCR) pollution control to units six and seven.

Annual generation of wastes from operation of units six and seven are described in Revised Table 6.14-2 (Duke Energy 1999d). About 680 tons of hazardous solid wastes are generated each year, in addition to the 100 tons from operation of the new units. Nonhazardous solid wastes total about 960 cubic yards annually from the existing units, compared to an estimated 500 cubic yards from the new units.

Demolition of fuel oil storage tanks is a separate project that includes removal and recycling of tanks one through nineteen. Once the tanks are removed, soil or groundwater contamination may be present, and remediation may be required. As noted earlier, PG&E is responsible for remediating existing contamination at the MLPP site, and is doing so under the guidance of DTSC as the designated agency. Until the tanks are removed, the extent of potential contamination is unknown, but is expected to be localized.

Installation of SCR pollution control to units six and seven will not result in any significant waste related impacts. Periodically, the catalysts must be replaced to maintain operating efficiency, and are typically recycled. In the event that recycling is not pursued, the catalyst would require disposal in a class I (hazardous) landfill. The amount of catalyst which must be recycled or disposed is insignificant, on the order of several tons annually.

The quantities of wastes generated during construction and operation of the MLPP project will not result in any significant waste management related impacts. Similarly, quantities of wastes associated with the activities described above, including continued operation of units six and seven, demolition of existing tanks, and installation of SCR catalyst, will not be significant. Considering the lack of impacts on individual disposal facilities and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous 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 required by 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 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, MLPP will develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure (Duke Energy 1999a, AFC p. 4-3).

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

Energy Commission staff concludes that Duke Energy will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during MLPP construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the Regional Water Quality Control Board or the CAL EPA - Department of Toxic Substances Control. Because hazardous wastes will be produced during project construction and operation, Duke Energy will utilize MLPP's existing EPA identification number as a hazardous waste generator (CAT 080 011 653). Accordingly, Duke Energy will be required 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.

MITIGATION

Based on the analysis of impacts and the design and operational features that have been incorporated into the project, Duke Energy has not proposed mitigation measures beyond those in place at MLPP (Duke Energy 1999a, AFC p. 6.14-13). However, as part of waste management operations associated with the ongoing operation of MLPP units six and seven, measures are routinely employed to minimize the amounts of wastes generated. The measures are incorporated in the Source Reduction Evaluation Review and Plan, and include recycling, operational

improvements, changes in production processes, and administrative controls (Duke Energy 1999a, AFC p. 6.14-5).

As an additional measure to help ensure proper waste management practices, staff proposes that Duke Energy develop and submit a waste management plan which will include details on the handling, packaging, labeling, storage, treatment, and disposal of wastes (proposed Condition of Certification WASTE-2).

Staff has examined the waste management related measures proposed by the Applicant and concluded that, together with applicable LORS and the additional measure proposed by staff, they will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste.

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during construction and operation of MLPP will not result in any significant adverse impacts if Duke Energy implements the waste management measures proposed in the Application for Certification (99-AFC-4), the additional measure proposed by staff below, 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, Duke Energy 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 may be required, Duke Energy should also contact representatives of the Monterey County Environmental Health Department and the Berkeley Field Office of the California Department of Toxic Substances Control for possible oversight.

CONDITIONS OF CERTIFICATION

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

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, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all expected waste streams, including projections of frequency 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, 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. 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 (as defined by American Society for Testing and Materials practice E 1527-97 Standard Practice for Phase I environmental Site Assessments) available for consultation during soil excavation activities. If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, prior to any further construction activity at that location, 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 stating the recommended course of action. If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the Monterey County Environmental Health Department and the Berkeley Field Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall notify the CPM in writing within 5 days of any reports filed by the environmental professional, and indicate if any substantive issues have been raised.

WASTE-4 Silt or related dredge material removed during work or maintenance on the cooling water intake system shall be tested and disposed of in an inland disposal facility approved by the California Department of Toxic Substances Control or the local Regional Water Quality Control Board.

Verification: The project owner shall notify the CPM via the Annual Compliance Report of the disposition of any silt or dredge material removed.

REFERENCES

- DTSC. 2000. Department of Toxic Substances Control. Letter from Salvatore Ciriello to Mike Ringer. February 25.
- Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.
- Duke Energy. 1999d. Data Responses 1-24, dated Oct.4, 1999.
- Duke Energy. 1999i. Duke Energy Supplementary AFC Filing on: Change in Project Description; Air Quality Increments & Cumulative Impacts Analysis; & Responses to Additional California Coastal Commission Follow Up Questions. Submitted to the California Energy Commission, November 22, 1999.
- Hoffman. 1999. Letter from Wayne Hoffman, Regional Environmental Manager, Duke Energy Power Services, to Ed Wylie, U.S. Army Corps of Engineers. May 4.
- Levine-Fricke. 1999. Summary of Selected Remedial Issues, Moss Landing Power Plant, Moss Landing, California. Prepared for Pacific Gas and Electric Company. November 29. Submitted to the California Energy Commission, December 6, 1999.

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 study area. This section summarizes the separate analyses by both the Duke Energy Moss Landing, Limited Liability Company (applicant) in the Application for Certification (AFC) and the Energy Commission staff (staff) of the potential traffic and transportation impacts (construction and operations) associated with proposed modifications to the Moss Landing Power Plant Project (MLPPP).

The applicant and staff analyses included an evaluation of the influx of large numbers of construction workers and their impact on roadway congestion and traffic flow. The review also considered the transportation of large pieces of equipment and how they can increase roadway congestion and increase traffic hazards. Several minor improvements to the transportation system are proposed with the MLPPP, including additional turn lanes at the Dolan Road/State Route 1 intersection. There will be no construction activities within the public right-of-way associated with the MLPPP. 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 MLPPP to have significant traffic and transportation impacts, and to assess 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 the project complies with the applicable Laws, Ordinances, Regulations, and Standards (LORS). Recently received information regarding other projects in the area has been considered in the cumulative impact section of this analysis.

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 that 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, regulate 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 1988 Monterey County Coastal Implementation Plan, Chapter 20.144 created development standards regarding major roadways, state highways, and public transit.

The 1987 Monterey County/North County Land Use Plan (Local Coastal) Program established goals and policies regarding the preservation of highway capacity for coastal access.

In response to a statewide law intended to coordinate land use and transportation planning, Monterey County developed a Congestion Management Plan (CMP) that dictates the acceptable service levels on major roadways and intersections. The standard for the CMP roadways and intersections is Level of Service (LOS) D, however, none of the affected intersections are CMP intersections.

The Regional Transportation Plan (RTP) is a compilation of goals, policies, objectives, and projects that guide transportation policy in the region. The RTP provides a framework for evaluating future conditions in the project area.

The Monterey County General Plan, in its transportation and circulation element states that the standard for the roadways and intersections is LOS C.

SETTING

STUDY AREA DESCRIPTION

STATE HIGHWAYS AND LOCAL ROADWAYS

The project site is located at the northeast corner of the State Route 1 and Dolan Road intersection in north Monterey County, California. Descriptions of some of the critical roads and highways in the study area are provided below.

Dolan Road extends from its western terminus at State Route 1 (near the MLPPP) to its eastern boundary in the town of Pajaro near Watsonville. Near the site, Dolan Road is 36 feet wide (2-12' lanes and 2-6' shoulders) and carries approximately 3,300 vehicles per day and is under the jurisdiction of Monterey County. The MLPPP site is served primarily from access points along Dolan Road.

State Route 1 provides direct access to the site via Dolan Road. State Route 1 traverses most of the state along the coast and is under the jurisdiction of California Department of Transportation (Caltrans). In the vicinity of the MLPPP site, State Route 1 is a two-lane highway with a 45 MPH posted speed and carries approximately 37,500 vehicles per day.

State Route 156 is a two-lane highway that connects State Route 1 with State Route 101. State Route 156 is approximately 4 miles south of the site. Daily traffic on State Route 156 is 25,000 vehicles per day on the west end (near SR 1) and 27,000 vehicles per day on the east end (near SR 101).

State Route 183 extends from State Route 1 in Castroville to the City of Salinas. It is a two-lane arterial through Castroville, a two-lane rural highway between Castroville and Davis Road, and a four-lane arterial east of Davis Road.

An alternative to State Route 156 for east-west travel is a combination of Dolan Road, Castroville Boulevard, and San Miguel Canyon Road (which connects with State Route 101). Castroville Boulevard is a two-lane rural road carrying approximately 5,500 vehicles per day. San Miguel Canyon Road is also a two-lane rural road. It carries approximately 16,400 vehicles per day.

U.S. Highway 101 serves regional and countywide travel as the major through route for the region. Through Monterey County, it is a four-lane highway with an interchange at State Route 156 and at-grade intersections with county roads.

ACCIDENT HISTORY

Dolan Road (between SR 1 and Castroville Boulevard) has an accident rate of 2.94 accidents per million vehicle miles (MVM) driven. Monterey County considers a rate greater than 4 per MVM as high. Therefore, the accident rate on Dolan Road is considered to be below Monterey County's standard.

Castroville Boulevard has an accident rate of 2.63 accidents per MVM for the segment between State Route 156 and Dolan Road, and a rate of approximately 1.5 accidents per MVM for the segment from Dolan Road to San Miguel Canyon Road. Both of these are below Monterey County's standard.

San Miguel Canyon road has had an accident rate of between 2.5 and 3.8 accidents per MVM for the segment between State Highway 101 and Castroville Boulevard, which is below Monterey County's standard.

Accident rate data on state roadways was provided by Caltrans for a 3-year period ending in September 1999. State Route 1 had a higher than average accident rate at Salinas Road (41 reported accidents) and at the State Route 156 interchange (38 reported accidents) and an average accident rate at Dolan Road (10 reported accidents) when compared to statewide averages for similar facilities. No fatalities were reported at these locations.

FUNDED AND PLANNED ROADWAY IMPROVEMENTS BY OTHERS

Two local roadway improvement projects in the area were completed within the last 3 months: signalization of the SR 156 and Castroville Boulevard and roadway surface rehabilitation of State Route 1. The latter project included resurfacing, restriping, new guardrails, and drainage improvements on State Route 1 from the State Route 183 interchange to Salinas Road. At the intersection with Dolan Road, the southbound left-turn lane along State Route 1 providing left-turn access onto Dolan Road has been restriped to a length of 250 feet plus taper. South of Dolan Road, State Route 1 has been restriped to include a two-way left-turn lane with a length of approximately 100 feet plus taper.

The following is a discussion of planned roadway improvements. Some are fully designed and largely funded, but most are largely conceptual and unfunded. None of these improvements are expected to be completed prior to construction or operation of the MLPPP.

Caltrans has long desired to widen State Route 1 to a 4-lane expressway between Castroville and the Santa Cruz County Line, with interchanges at State Route 183 and Salinas Road. The ultimate right-of-way for this section has been tentatively established by Caltrans as 105' (80' existing along MLPPP project frontage). At a July 1999 strategy meeting with interested public and private parties, Caltrans identified the following improvement ideas:

- Extend the southbound left-turn pocket at Dolan Road to the Elkhorn Slough Bridge;
- Pavement rehabilitation from State Route 183 to north of Salinas Road; and
- Prepare a Project Study Report for long-term improvements between Castroville and Watsonville.

Monterey County has conditioned the Moro Cojo Development with implementing a northbound acceleration lane for the right turn from Dolan Road to State Route 1. Caltrans has subsequently concluded that this measure would not be beneficial and has requested other improvements at the intersection as described later in this report.

Implementation of the Moss Landing Harbor District Master Plan includes consolidation of the three access points to a single location near the Elkhorn Slough Yacht Club and widening of the Sandholdt Road Bridge.

The proposed Pajaro Valley Golf Course Development expansion may be required to contribute up to \$660,000 in traffic mitigation fees that may be used for the Salinas Road/State Route 1 intersection.

The approved History & Heritage Center is required to fund improvements to State Route 1 near the south entrance to Moss Landing at Moss Landing Road and Pieri Court. Caltrans is reviewing the conceptual plans.

Salinas Road is planned to be widened to four lanes with development in the corridor.

San Miguel Canyon Road is planned to be a four-lane highway. Monterey County has been collecting funds to widen the most critical segment (State Route 101 to Castroville Road). Caltrans is planning to construct an interchange (completion expected in 2002) where San Miguel Canyon Road intersects State Route 101.

A seven mile bypass of State Route 101 (approximately 1 mile to the east of the existing alignment) is planned from Russell Road in Salinas to Crazy Horse Canyon Road in northern Monterey County. The project is partially funded at present.

Improvements are planned for State Routes 156 and 183 but nothing is funded or imminent. Davis Road is planned for widening between State Route 183 and Blanco Road, but it is also unfunded.

RAILWAYS

The Union Pacific (previously Southern Pacific) Coast Line runs immediately east of the MLPPP and crosses Dolan Road at a controlled crossing. The Coast Line runs between San Luis Obispo and San Francisco. Freight rail service to the region is provided by the Watsonville Branch Line from the Coast Line. Spur lines run to the MLPPP site from the Coast Line. The Watsonville Branch connects Watsonville and Gilroy, but it only services a few trains per year.

PUBLIC TRANSPORTATION

Monterey County has three primary bus carriers: Monterey-Salinas Transit, Amtrak, and Greyhound. Monterey-Salinas Transit provides fixed route service in the unincorporated areas and the cities of Carmel, Marina, Del Rey Oaks, Monterey, Pacific Grove, Seaside, and Salinas. They also connect with Santa Cruz County service in Watsonville.

Amtrak provides bus service connecting Monterey and Salinas with its rail service in San Jose. Greyhound provides relatively infrequent service connecting several cities in the region.

TRUCK TRAFFIC

Monterey County has adopted “super truck” routes, which are meant to concentrate truck traffic to the benefit of local roadways that either have pavement sections that are incompatible with large trucks or significant congestion. The “super truck” routes in the vicinity of the project are: State Routes 1, 68, 101, 156, and 183.

Monterey 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.

HAZARDOUS MATERIALS BY TRUCK

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 inspection stations along major highways and interstates; and 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.

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. A LOS C threshold, as noted above, is the minimum standard accepted by Monterey County.

Exhibit 5 in the Application for Certification summarizes the current performance levels of the principal roadways in the project area. The following roadway segments are operating worse than the LOS C standard:

- State Route 1 (State Route 156 to State Route 183);
- State Route 1 (State Route 183 to Dolan Road);
- State Route 1 (Dolan Road to Salinas Road);
- State Route 1 (Salinas Road to State Route 129);
- Salinas Road (State Route 1 to Wermer Road);
- San Miguel Canyon Road (U.S. Highway 101 to Prunedale North);
- San Miguel Canyon Road (Prunedale North to Castroville Boulevard);
- San Miguel Canyon Road (Castroville Boulevard to Echo Valley Road);
- U.S. Highway 101 (throughout the study area);
- State Route 156 (Castroville Boulevard to U.S. Highway 101);
- State Route 183 (Davis Road to Espinosa Road);
- State Route 183 (Espinosa Road to Blackie Road);
- State Route 183 (Blackie Road to State Route 156); and
- Davis Road (Central to State Route 183).

Dolan Road and Castroville Boulevard are operating at an acceptable LOS.

Exhibit 13 in the Application for Certification summarizes the current performance levels of the principal intersections in the project area. The following unsignalized intersections are operating worse than the LOS C standard:

- State Route 1 and Salinas Road (a.m. and p.m. peak hours);
- State Route 1 and Dolan Road (p.m. peak hour);
- Prunedale Road North and State Route 156 (p.m. peak hour); and
- State Route 1 and State Route 183 (p.m. peak hour).

The unsignalized intersection of State Route 1 and Dolan Road provides a major access point to the MLPPP site. While the overall morning peak hour operation is LOS A, the westbound (Dolan Road) left-turn movement is operating at LOS F. During the afternoon peak hour, the overall operating condition is LOS F with the westbound (Dolan Road) left-turn movement operating at LOS F and the right-turn movement operating at LOS D.

The sight distance at the State Route 1/Dolan Road intersection is limited when looking south from Dolan Road. The desired intersection sight distance identified by Caltrans' standards (for 50 MPH speeds on State Route 1) is 550 feet. The minimum sight distance per Caltrans' standards is 430 feet. Field observations

were conducted to assess the driver visibility at the intersection. The current sight distance from Dolan Road to the south is limited to approximately 380 feet. In addition to limited sight distances, the lack of acceptable gaps in traffic on State Route 1 may contribute to drivers taking imprudent risk in trying to enter from Dolan Road.

Exhibit 13 in the Application for Certification indicates that the current performance levels of the principal signalized intersections in the project area are operating at or better than the LOS C standard.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION PHASE

LINEAR FACILITIES

The MLPPP is not proposing to construct any transmission, natural gas, sewer, or water lines within the public right-of-way. Therefore, no traffic impacts are expected from such activities.

If the circumstances should change, resulting in the need to construct transmission, gas, water, or sewer facilities within or adjacent to a public right-of-way, then a construction traffic control plan will be needed and it should comply with Caltrans "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans 1996).

COMMUTE AND VISITOR TRAFFIC

Construction is expected to last a total of 24 months, with most activities occurring on weekdays and some on Saturday. Exhibit 14 in the AFC summarizes the staffing and trip generation expected during the construction phase. The estimated average number of workers traveling to/from the site on a typical day is 242, with most working a "day" shift that starts between 5:30 and 6:30 a.m. and a small portion working a "swing" shift. During the peak month, approximately 732 workers are expected on a typical weekday, of which most will be on a "day" shift. All construction workers will park on-site.

Visitor traffic was estimated at 5% of staffing, which equates to 12 persons per day on average and 37 persons per day during the peak month period.

Estimates of the number of trips by construction workers and visitors is based upon a conservative assumption that most workers are driving alone to/from the site. During the peak month, the combination of commute and visitor traffic is expected to generate approximately 644 trips during the hours of 5:30 – 6:30 a.m. and 80 trips during the ambient peak period of 7:30 – 8:30 a.m. The trip generation will be

reduced to 213 and 26, respectively during average construction periods. In the morning, approximately 90% of the trips will be inbound to the site.

During the peak construction month, the combination of construction workers and visitors will generate approximately 651 trips during the hours of 2:15 – 3:15 p.m. and 80 trips during the ambient peak period of 4:30 – 5:30 p.m. The trip generation will be reduced to 220 and 26, respectively during average construction periods. Most (approximately 90%) of the afternoon trips will be outbound from the site.

The AFC estimated the location of the potential workforce based upon population and distance from the MLPPP. The calculation included Monterey, Santa Cruz, San Benito, and Santa Clara County. Using this approach, the AFC concluded that 47% of the construction workers will come from areas to the north and 53% from the south.

TRUCK TRAFFIC

The AFC suggests that rail will be “emphasized” versus long-haul trucks as a means to deliver equipment and materials to the site and to remove demolition debris. Rail will be the exclusive means to deliver heavy equipment such as generators, turbines, and stacks.

The transportation and handling of hazardous substances associated with the MLPPP can increase roadway hazard potential. The handling and disposal of hazardous substances are addressed in the Waste Management section and the Hazardous Materials section of this report. 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.

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.

Product deliveries via truck will contribute, along with other MLPPP-generated traffic, to create localized impacts to roadway performance. During the first three months of construction, truck deliveries are expected to total approximately 1,000. Consequently, on a typical day during the first three months of construction, the MLPPP would generate more than 100 trips per day. Up to 20 trips per hour will likely occur during the peak commute periods.

The AFC predicts that the spatial pattern of truck trips will be similar to commute trips in that slightly more than half of the trips (53%) will come from the south and these truck trips will use routes similar to the construction workers.

TOTAL PROJECT CONSTRUCTION TRAFFIC

Exhibit 14 in the AFC includes estimates for total project construction traffic. The total traffic associated with construction personnel, visitors and construction equipment during peak staffing is estimated at 1,690 trips during an average day.

During the peak construction period, the combination of commute and visitor traffic is expected to result in approximately 645 trips during the hours of 5:30 – 6:30 a.m. and 81 trips during the ambient peak period of 7:30 – 8:30 a.m. MLPPP trips will be reduced to 215 and 30, respectively during average construction periods. In the morning, approximately 90% of the trips will be inbound to the site.

During the peak construction period, the combination of construction workers and visitors will generate approximately 652 trips during the hours of 2:15 – 3:15 p.m. and 81 trips during the ambient peak period of 4:30 – 5:30 p.m. MLPPP trips will be reduced to 219 and 30, respectively during average construction periods. Most (approximately 90%) of the afternoon trips will be outbound from the site.

ROADWAY AND INTERSECTION OPERATING CONDITIONS

The combination of commute, truck, and visitor traffic will degrade roadway operations in the localized area. While only one intersection will degrade from acceptable to unacceptable (San Miguel Canyon Road/Castroville Boulevard during afternoon peak hour), the project will result in increases in traffic on several roadways and intersections already operating worse than the LOS C threshold identified above.

Of particular concern is the safety impact from additional traffic at the State Route 1/Dolan Road intersection. The addition of truck traffic from the project entering this intersection (especially making the left-turn from westbound Dolan Road to southbound State Route 1) is a problem because of the limited sight distance, high speeds, and few gaps in traffic. The applicant has agreed to implement truck-restrictions at this intersection for the most problematic movements.

The applicant has agreed to implement physical improvements at the intersections of State Route 1 and Dolan Road, and Dolan Road and the power plant's contractor driveway. These improvements (as identified by Staff, Caltrans, and Monterey County staff) will mitigate project traffic impacts at those locations, thereby reducing a potential significant impact to less than significant. Mitigation measures to address project impacts to other roadway segments and intersections in the study area have been negotiated between the applicant and Monterey County staff as part of the CEQA process for the four proposed actions on the site, including the MLPPP. These mitigations are documented in a Transportation Management Plan and take the form of physical improvements to the intersections of: Dolan Road/Castroville Boulevard, Elkhorn Road/Castroville Boulevard, and Castroville Boulevard/San Miguel Canyon Road.

RAILWAYS

The AFC suggests that rail will be “emphasized” versus long-haul trucks as a means to deliver equipment and materials to the site and to remove demolition debris. Rail will also be used to deliver heavy equipment such as generators, turbines, and stacks. The existing spur line to the site from Watsonville has only been used a few times in the last two years according to the AFC. Consequently, deliveries via rail should not disrupt any existing Union Pacific operations. The use of the spur line for deliveries to the site has the potential to increase conflicts between trains and automobiles at at-grade crossings.

OPERATIONAL PHASE

COMMUTE AND VISITOR TRAFFIC

The operational phase of the MLPPP will add only 10 persons to the existing 88 employed at the site, resulting in 33 additional daily vehicle trips. The project is expected to add 9 morning and 9 afternoon peak hour trips.

TRUCK TRAFFIC

The existing site averages 10 – 15 truck trips per day on a typical weekday. The MLPPP will utilize rail as a primary means to deliver large materials; however, the MLPPP will add one additional truck delivery per week according to the AFC.

The transportation and handling of hazardous substances associated with the MLPPP can increase roadway hazard potential. 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 operation of the facility, see the Waste Management and Hazardous Materials Sections of the PSA.

The handling and disposal of hazardous substances are addressed in the Waste Management section and the Hazardous Materials section of this report. 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.

IMPACTS TO ROADWAY OPERATIONS

The MLPPP-generated traffic of 33 trips per day will contribute in a small way to the congestion in the local region; however, this will not create any significant traffic problems in and of itself. These new trips are subject to the County’s Traffic Impact Mitigation Fee Program, since these trips would be on facilities operating below the LOS C threshold, the minimum standard accepted by Monterey County.

The MLPPP will receive aqueous ammonia, a hazardous material, via rail. The inherent conflicts between rail and passenger vehicles along the rail spur, and the possibility of derailment from any number of causes, creates a potential environmental impact from the delivery of any hazardous materials. The most specific concern is the potential for ammonia to reach the Elkhorn Slough.

The MLPP will use approximately 40,000 gallons of aqueous ammonia every month. Two deliveries are expected every month. According to the U.S. Department of Transportation, eight incidents involving rail shipments of hazardous materials have been reported in California during the five-year period of 1995-1999. Seven of these incidents resulted in no spillage. The amount of spillage in the one other incident was .13 gallons (out of more than 500,000 tons transported).

The handling and disposal of hazardous substances are addressed in the Waste Management and the Hazardous Materials sections of this report. The project will be subject to all federal and state standards established to regulate the transportation of hazardous substances.

CUMULATIVE IMPACTS

In addition to the traffic generated by MLPPP construction activities, the applicant will also be performing other construction operations on the existing power plant. These additional activities will start prior to MLPPP construction; however, some of the additional construction activities are anticipated to occur concurrently with MLPPP construction. Two peak periods of approximately 3 months each are anticipated to occur prior to peak MLPPP construction staffing. During these periods, the cumulative total of other power plant construction activities and project construction staffing will number between 600 - 720 workers, which is less than the 732 workers expected on a typical weekday during peak month MLPPP construction activity. Therefore, the impacts are not expected to exceed those evaluated above for peak project construction periods.

The AFC does not identify any off-site development projects in the study area that would generate additional traffic during the MLPPP construction phase. However, the North County area will likely continue to experience development during the 24-month construction period. Consequently, traffic volumes on the roadways in the vicinity of the MLPPP will likely increase.

There are 40 identified long-term developments in various stages of approval or implementation throughout the north Monterey County area. Exhibits 26 through 31 of the AFC provide information on these development projects including location, land use, size and estimated trip generation. These development projects are estimated to generate a total of 12,500 daily trips with 1,460 occurring during the morning peak hour and 1,625 occurring during the evening peak hour. In addition, there is expected to be a substantial amount of population growth in the City of Salinas and on the Monterey Peninsula. This additional regional growth is expected to increase traffic an additional 1 to 2 percent per year on the State highway system

for the next 20 years. Consequently, traffic volumes on the roadways in the vicinity of the MLPPP will likely significantly increase over the next 20 years.

While the proposed improvements to State Route 1 and Dolan Road will mitigate the project's long-term impacts (33 daily trips during operations), the conditions along State Route 1 will deteriorate in the future with additional development in the County.

Caltrans desires to widen State Route 1 in the vicinity of the power plant to a 4-lane facility as part of improvements for the broader area. As a first step towards this improvement, Caltrans intends to prepare a Project Study Report to define the project. A condition is identified in this document to require the MLPPP to dedicate the right-of-way that is anticipated to be necessary for the ultimate 4-lane facility.

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 MLPPP 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

PROPOSED MITIGATION

The applicant has indicated their intention to comply with all LORS relating to the transport of oversize loads and the transport of hazardous materials. The applicant has also proposed to implement travel demand management measures and to construct physical improvements at several locations. These measures are identified in the March 2000 Transportation Management Plan submitted to Monterey County.

TRAVEL DEMAND MANAGEMENT

The project applicant has proposed the following strategies to reduce traffic impacts from the proposed project by minimizing trips and managing the direction of travel:

- Work hours during construction will be scheduled to avoid peak travel periods with the morning shift starting no later than 7:00 a.m., the afternoon shift not ending between 4:00 – 5:30 p.m., and the evening shift not starting between 4:00 – 6:00 p.m.;

- All overweight shipments will be made by rail;
- Truck traffic related to the project will be prohibited from making the southbound left-turn from State Route 1 to Dolan Road between the hours of 6:30 – 8:30 a.m. and 4:00 – 6:00 p.m.;
- Truck traffic related to the project will be prohibited from making the westbound left-turn from Dolan Road to State Route 1 during all hours;
- Workers will be required to obtain a special permit, by demonstrating the need to travel northbound on State Route 1, to exit the Dolan Road gate and travel westbound;
- On-site meal services will be provided to discourage off-site trips for food; and
- Employee carpooling will be encouraged by designating a travel demand management coordinator, providing preferred parking for carpools/vanpools, and by providing free vanpool service.

PHYSICAL IMPROVEMENTS

The following improvements are intended to mitigate the project's incremental impact during the construction phase and have been identified through discussions with Monterey County, Caltrans, the Transportation Agency for Monterey County, and the applicant. The timing of these improvements is identified in the "conditions" section.

State Route 1/Dolan Road - The applicant will do the following to the satisfaction of Caltrans:

- construct a northbound right-turn lane on State Route 1 with a 4' shoulder;
- create a dedicated right-turn lane on westbound Dolan Road (creating two westbound lanes at State Route 1);
- improve the shoulder on the east side of State Route 1 (north of Dolan Road);
- lengthen the southbound left-turn pocket on State Route 1; and
- modify the southbound acceleration lane in the median of State Route 1.

Contractors Driveway/Dolan Road - The applicant will construct channelization and capacity improvements at this location. Specifically, the applicant will design and construct a westbound right-turn lane, an eastbound left-turn lane, and a southbound left- turn median acceleration lane on Dolan Road at the Contractor's driveway.

Off-site Intersections – The applicant, in negotiations with Monterey County, has agreed to fully fund the following improvements with future reimbursements for the portion above the applicant's "fair share" contribution:

Dolan Road/Castroville Boulevard

- Add an eastbound right-turn lane on Dolan Road; and

- Lengthen the northbound right-turn lane on Castroville Boulevard.

Elkhorn Road/Castroville Boulevard

- Add eastbound and westbound left-turn lanes on Castroville Boulevard;
- Correct the vertical curve sight distance problem on Castroville Boulevard; and
- Improve the westbound merge onto Castroville Boulevard.

Castroville Boulevard/San Miquel Canyon Road

- Improve the eastbound right-turn lane on Castroville Boulevard; and
- Improve the channelization (striping).

Rail Spur Improvements – Upgrades to the rail spur on the eastern portion of the site will be made to improve safety and operational capacity. This activity will be coordinated with, and permitted by, Union Pacific and the PUC as appropriate.

OTHER MITIGATION

In addition to the above, staff recommends the following mitigation measures:

- The applicant should work with the Public Utilities Commission, Caltrans, California Highway Patrol, and Monterey County to develop and implement a plan to manage traffic (to include measures such as flashing lights, gates, or a flagman) at the at-grade crossings along the railroad spur line during periods of high activity, particularly related to hazardous materials deliveries;
- The applicant should manage the on-site construction-period parking to ensure no project-related vehicles park off-site; and
- The applicant should repair any damage to Dolan Road during MLPPP construction to their pre-project construction condition.

COMPLIANCE WITH LORS

The applicant has stated its intention to comply with all federal and state LORS. A condition to ensure compliance is proposed below. Therefore, the project is considered consistent with identified federal and state LORS.

This project, along with other proposed activities on the site, is being environmentally reviewed by Monterey County and other affected agencies.

CONCLUSIONS AND RECOMMENDATIONS

CONSTRUCTION ELEMENT

1. During the peak of the construction phase, the project will generate approximately 1,700 vehicle trips per day, with approximately 80 trips occurring

during both the morning and afternoon commute hours. The proposed work shift management plan will minimize the project's contribution to congestion during peak hours.

2. The combination of physical improvements and truck movement prohibitions at the State Route 1/Dolan Road intersection will mitigate the project's impacts at this location.
3. The County and the applicant have negotiated a set of off-site improvements to key intersections that will be funded by the applicant with later reimbursement for the amount exceeding their fair-share. The County has concluded and staff agrees that these improvements will mitigate the project's impact.
4. All overweight shipments will be by rail, which will minimize disruption to the roadway system. Improvements to the rail spur are planned as part of the project.
5. The transportation of hazardous substances can be mitigated to insignificance by compliance with federal and state standards. Aqueous ammonia will be delivered by rail.
6. Construction activities associated with the project have the potential to damage the surface of local roadways. The applicant should be required to repair damaged roadways to their pre-MLPPP construction condition.
7. All construction-workers will be required to park on-site, and workers will be required to obtain a special permit to leave the site and travel westbound (towards State Route 1).

OPERATIONAL ELEMENT

8. The operational phase of the MLPPP will add only 10 persons to the existing 88 employed at the site, resulting in 33 additional daily vehicle trips. The project is expected to add only 9 morning and 9 afternoon peak hour trips.

CUMULATIVE IMPACTS

9. There are 40 identified long-term developments in various stages of approval or implementation throughout the north Monterey County area estimated to generate a total of 12,500 daily trips. In addition, there is expected to be a substantial amount of population growth in the City of Salinas and on the Monterey Peninsula. The project's contribution to the cumulative impacts will be small, as the operational phase will only employ 10 persons.
10. Three other projects are proposed for the site (Tank Farm Demolition, Selective Catalytic Reduction, and Oily Water Separator/Energy Management Center). The planned staggering of these activities will result in a combined peak construction level (measured by employees) that is slightly less than the individual peak (for the MLPPP) analyzed in this document.

PROPOSED CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with California Department of Transportation (Caltrans) and Monterey County limitation 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.

TRANS-2 The project owner or their contractor shall comply with California Department of Transportation (Caltrans) and Monterey 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.

TRANS-3 The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed. In addition, the project owner shall work with the California Public Utilities Commission (CPUC), Caltrans, California Highway Patrol, and Monterey County to develop and implement a plan to manage traffic at the at-grade crossings along the railroad spur line, particularly related to hazardous materials deliveries. The plan should include provisions for safely warning and stopping vehicular traffic (such as flashing lights, gates, or a flagman). The project owner shall submit the railroad crossing plan to the CPM for approval.

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. At least 60 days prior to the shipment of any hazardous materials by rail, the project owner shall submit a plan to manage traffic at the at-grade crossings to Monterey County for review and comment and to the CPM for approval.

TRANS-4 Immediately prior to completion of the project's construction, the project owner shall repair Dolan Road to its pre-construction condition.

Protocol: Prior to start of start of construction, the project owner shall photograph Dolan Road from State Route 1 to Castroville Boulevard. The project owner shall provide the CPM, Monterey County and Caltrans with a copy of these photographs. Prior to start of construction, 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 of the completion of project construction, the project owner will meet with the CPM and Monterey County 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.

TRANS-5 During construction of the power plant and all related facilities, the project owner shall ensure that all parking occurs on-site.

Verification: The CPM shall periodically observe conditions in the field to verify all parking is occurring on-site.

TRANS-6 Prior to reaching a construction staffing level of 400 for the project, the owner shall complete the construction of the physical improvements at the State Route 1/Dolan Road intersection as identified in the above mitigation section.

Protocol: Prior to initiating any construction, the project owner shall submit a Traffic Management Plan to Caltrans, obtain the necessary encroachment permits, and prepare the needed environmental studies. The project owner shall, in coordination with Caltrans, the California Coastal Commission and Monterey County, design and construct the roadway improvements described above to the satisfaction of Caltrans.

Verification: At least 30 days prior to reaching the 400 persons staffing level for construction of the project, the owner shall notify the CPM that the roadway improvements have been completed and are ready for inspection.

TRANS-7 Prior to the start of construction activities related to the MLPPP, the project owner shall complete the construction of the physical improvements at the Dolan Road entrance as identified in the mitigation section of this FSA.

Protocol: The project owner shall, in coordination with Monterey County, design and construct the roadway improvements described above to the satisfaction of Monterey County Public Works staff.

Verification: At least 30 days prior to start of construction activities related to the project, the owner shall notify the CPM that these roadway improvements have been completed and are ready for inspection.

TRANS-8 The project owner shall implement the travel demand management strategies described in the mitigation section above, including: shift management, overweight shipments by rail, on-site food availability, incentives for carpooling, and truck movement restrictions at the State Route 1/Dolan Road intersection. The project owner shall report on the status of each strategy element in the monthly or annual compliance report as appropriate.

Verification: The project owner shall report on the status of each strategy element in the monthly or annual compliance report as appropriate. The CPM will periodically review and verify compliance of the transportation demand management strategies in consultation with Monterey County and Transportation Agency for Monterey County.

TRANS-9 Prior to start of construction activities related to the project, the project owner shall make all necessary arrangements to allow the use of the existing rail line for delivery of construction materials and export of construction and demolition debris.

Protocol: All rail improvements should be coordinated with Union Pacific and all relevant permits obtained from the CPUC.

Verification: At least 30 days prior to shipping any overweight or hazardous materials via the rail spur, the project owner will obtain a letter from the CPUC indicating the facility has been sufficiently improved for such use. This letter will be submitted to Monterey County and the CPM for their files.

TRANS-10 Prior to start of construction activities related to the project, the project owner shall pay the County to implement improvements to three intersections as identified in the mitigation section of this PSA: Dolan Road/Castroville Boulevard, Elkhorn Road/Castroville Boulevard, and Castroville Boulevard/San Miquel Canyon Road.

Protocol: The project owner and the County may establish a reimbursement arrangement to cover the portion of the improvements beyond the "fair share" of the project.

Verification: Within 30 days of project certification, the project owner shall submit to the CPM evidence that the County has been paid to implement the improvements.

TRANS-11 Prior to start of construction activities related to the project, the owner shall dedicate the right-of-way needed for the ultimate transportation facility in the State Route 1 corridor. Caltrans has defined the ultimate right-of-way as 105', necessitating 10' of dedication on the west side and 15' on the east side of State Route 1. The dedication shall also include permanent access rights along the project frontage.

Verification: Prior to start of construction, the project owner shall submit written verification to the CPM demonstrating that the dedication has occurred.

REFERENCES

California Department of Transportation (Caltrans), 1997 Traffic Volumes on California State Highways, June 1998.

California Department of Transportation (Caltrans), TASAS Table B District 2 Selective Accident Rate Calculation, October 1999.

California Department of Transportation (Caltrans) – District 5, Letter from Charles Larwood to Anthony Carney of Monterey County Planning Department, February 28, 2000.

California Department of Transportation (Caltrans)- District 5, e-mail regarding conditions of approval to Steve Brown of Fehr & Peers Associates, April 14, 2000.

Duke Energy North America, Moss Landing Power Plant, Response to Project Data Requests, October 1999.

Duke Energy North America, Moss Landing Power Plant, Response to California Energy Commission Data Requests, November 1999.

Duke Energy North America, Moss Landing Power Plant Application for Certification Supplementary Filing, Change in Project Description and Responses to California Coastal Commission Follow Up Questions, November 1999.

Duke Energy North America, Moss Landing Power Plant Application for Certification Supplementary Filing, Attachment 1 Traffic Analysis Report, November 1999.

Duke Energy North America, Transportation Management Plan for Tank Farm Demolition, Selective Catalytic Reduction, Oily Water Separator & Energy Management Center, and Combined Cycle Modernization, March 18, 2000.

Meeting with staff of Monterey County Planning & Public Works, TAMC, Caltrans District 5, and Duke Energy on March 16, 2000.

Monterey County, Monterey County Coastal Implementation Plan Part 1, Title 20 Zoning Ordinance, August 1995.

Public Workshop on PSA, Comments from applicant and public agencies, March 1, 2000.

Transportation Agency for Monterey County (TAMC), Letter from Joe Lopez to Paul Richins of CEC, March 14, 2000.

TRC, Letter from Eric Walther to Paul Richins of CEC regarding Aqueous Ammonia Transport, April 4, 2000.

NOISE

Testimony of Steve Baker

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night during which it is produced, and the proximity of the facility to any sensitive receptors combine to determine whether the facility will meet applicable noise control laws and ordinances, and whether it will exhibit significant adverse environmental impacts.

The purpose of this analysis is to identify and examine the likely noise impacts from the Moss Landing Power Plant Project (MLPPP), and to recommend procedures to ensure that the resulting noise impacts will comply with applicable laws and ordinances, and will be adequately mitigated. This will enable the Energy Commission to make findings that:

- the MLPPP will likely be built and operated in compliance with all applicable noise laws, ordinances, regulations and standards (LORS); and
- the MLPPP will 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 level exposure as a function of the amount of time during which 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

Similarly, there are no state regulations governing offsite noise. Rather, state planning law (Gov. Code, § 65302) requires that local authorities such as counties or cities prepare and adopt a general plan. Government Code section 65302(f) requires that a noise element be prepared as part of the general plan to address foreseeable noise problems.

Other state LORS include the California Environmental Quality Act (CEQA) and 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. The CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq., Appendix G, § XI) explain that 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 groundborne vibration or groundborne 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 (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

LOCAL

MONTEREY COUNTY GENERAL PLAN NOISE ELEMENT

Two policies enunciated in this noise element (Monterey 1995) impact the construction and operation of a project such as the MLPPP. Policy 22.2.1 requires that new projects conform to the exterior noise parameters established in Table 6, “Land Use Compatibility for Exterior Community Noise Environments.” Table 6 specifies that noise levels from 50 to 70 dBA L_{dn} or CNEL¹ are normally acceptable for industrial or utility land use categories such as the MLPPP.

Policy 22.2.5 requires that ambient sound levels be less at night (defined as 10 p.m. to 7 a.m.) than during the day. While this limitation is impractical for a power plant that is intended to operate day and night, it can be applied to construction activities (see proposed Condition of Certification **NOISE-8** below).

MONTEREY COUNTY NOISE ORDINANCE

Chapter 10.60 of the Monterey County Health and Safety Code is entitled “Noise Control” (Monterey 1985). Paragraph 10.60.030 restricts the operation of noise-producing devices, requiring that, “No person shall...operate any machine...which produces a noise level exceeding 85 dbA measured fifty feet therefrom.... (Ord. 2459 § 3, 1978.)” This limitation can be applied to the operation of the MLPPP.

¹ For definitions of these and other noise measurement terms, see **Noise: Appendix A** immediately following this section.

SETTING

The MLPPP involves the construction and operation of a new 1,060 MW combined cycle power plant on the site of the existing Moss Landing facility. It will be built concurrently with two separate projects not licensed by the Energy Commission; the demolition and removal of 19 fuel oil storage tanks that once fed Moss Landing Units 1 through 7, and a modernization and upgrade of Units 6 and 7.² Units 6 and 7, a pair of 750 MW natural gas-fired supercritical steam boiler units built in the 1960s, are to be retrofitted with selective catalytic reduction (SCR) systems to reduce air emissions. Included in this retrofit project is replacement of the existing forced draft fans, installation of new induced draft fans, and replacement of the high-pressure steam turbine rotors, which will increase the generating capacity of each unit by 15 MW while improving efficiency. The MLPPP and the upgraded Units 6 and 7 will utilize existing water, electrical and natural gas piping and transmission systems (Duke Energy 1999a, AFC §§ 1.1, 1.4.2, 1.4.3, 1.4.4, 1.4.5; Duke Energy 1999h).

The MLPPP will be located within the existing Moss Landing Power Plant site. This facility, zoned for heavy industrial use, lies in an area occupied by industrial facilities, agricultural lands, some light commercial and sparse residential uses, and recreational beaches and tidal wetlands (Duke Energy 1999a, AFC §§ 1.4.2, 1.5.2, 2.0, 2.3.2). Sensitive noise receptors in the vicinity of the project are limited to scattered residences; no hospitals, libraries, schools or churches lie near enough to the site to be affected by noise from the project. The nearest residences are a single home 1,500 feet north of the Moss Landing facility;³ boats moored in the Inner Channel atop the subsurface cooling water discharge pipes from Units 6 and 7;⁴ a single home at Highway 1 and Moss Landing Road, south of the facility; a residential neighborhood adjacent to Allen Street, further to the south; more boats moored in the harbor to the north, adjacent to the Highway 1 bridge over Elkhorn Slough (Flake 2000, pers. comm.); and several residences at the Calcagno Dairy Farm, east of the facility.

In order to predict the likely noise effects of the MLPPP on these sensitive receptors, the applicant commissioned an ambient noise survey of the area. This survey was performed by a qualified consultant using typical monitoring and analysis equipment and methods (Duke Energy 1999a, AFC §§ 6.12.1.3; Appendix 6.12-1, § 4).

The applicant's noise survey monitored noise levels at the residence to the north, at the Allen Street residential neighborhood, and at the Calcagno Dairy residences for a period of 25 continuous hours. Additional short-term measurements were taken during this period at the residence located at Highway 1 and Moss Landing Road, and at the power plant entrance on Dolan Road.

² Units 1 through 5 were permanently retired in January 1995 (Duke Energy 1999a, AFC § 2.1).

³ This residence lies 2,350 feet from the site of the MLPPP itself (Duke Energy 1999a, AFC Figure 6.15-6).

⁴ Some of these boats serve as residences. The nearest lie approximately 2,200 feet from the MLPPP itself (Flake 2000; personal communication).

Survey results depict a relatively steady, fairly high level of background noise at the residence to the north, ranging from 53 to 58 dBA, with little variance from day to night. This may be a result of steady noise from the PG&E switchyard, which lies between the residence and the project site, and from the transformers along the north side of the building that houses Units 1 through 5.⁵ Background noise level at the Allen Street residential neighborhood varied from 41 to 58 dBA, relatively quiet at night and higher, due to traffic noise, during the morning and evening commute hours. Background noise at the Calcagno Dairy Farm residences ranged from 41 to 55 dBA, with a pattern of loud noises indicating traffic and other activity related to the dairy farm. Spot checks showed that background noise at the residence at Highway 1 and Moss Landing Road exhibited a low of 52 dBA (Duke Energy 1999a, AFC Table 6.12-4; Figures 6.12-3, 6.12-4, 6.12-5; Appendix 6.12-1).

IMPACTS

Project noise impacts can be created by construction, and by normal operation of the power plant.

PROJECT SPECIFIC IMPACTS — CONSTRUCTION

COMMUNITY EFFECTS

Construction noise is a temporary phenomenon; the construction period for the MLPPP, along with the associated oil storage tank removal and Units 6 and 7 retrofit, is scheduled to last 29 months (Duke Energy 1999a, AFC §§ 1.4.6, 2.3.3.14). Construction of an industrial facility such as a power plant is typically and unavoidably noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempted from enforcement by local ordinances.

There are no specific LORS limiting construction noise in Moss Landing. The Monterey County General Plan Noise Element (Monterey 1995) addresses long-term noise sources, but provides some guidance that may be useful for construction noise. Policy 22.2.5, in requiring that noise levels be lower at night than during the daytime, defines night as the period from 10 p.m. to 7 a.m. Staff proposes using this definition for guidance in recommending limits on noisy construction work (see below).

The applicant has predicted the noise impacts of project construction on the nearest sensitive receptors (Duke Energy 1999a, AFC § 6.12.2.1; Table 6.12-8). Noise levels at the nearest residence (to the north) are projected to reach 52 to 57 dBA for most work; this compares to the ambient background noise levels here of 53 to 58 dBA. Such an increase in noise level is not obtrusive, and in fact barely noticeable.

⁵ Units 1 through 5 provided power at 115 kV and 230 kV to serve local (Monterey, Salinas, Santa Cruz) loads and more distant (Santa Clara Valley) loads. Since the decommissioning of Units 1 through 5, these transformers are used to convert power from the 500 kV switchyard (which receives the output of Units 6 and 7) to 115 kV and 230 kV (Duke Energy 1999a, AFC § 2.1.1.2).

Noisier work, such as pile driving, is projected to reach 63 dBA at this residence. Such a noise level is noticeable, but will be tolerable to these residents due to its temporary nature, and to the fact that the applicant commits to limiting noisy construction work to the daytime hours (Duke Energy 1999a, AFC § 6.12.2.1). Construction noise impacts at the boats moored in the Inner Channel will be identical; impacts at the other, more distant receptors will be less.

STEAM BLOWS

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feedwater and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before 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 quite 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.

These steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. This would attenuate to about 104 dBA, an exceedingly disturbing level, at the nearest residence, 2,350 feet distant, and at the boats in the Inner Channel, 2,200 feet distant. In order to minimize disturbance from steam blows, the steam blow piping can be equipped with a silencer that will reduce noise levels by 20 to 30 dBA, or to a level of 74 to 84 dBA at the nearest residence. This is still 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, variously 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 80 dBA at 100 feet; noise levels at the nearest residence would thus be about 54 dBA, equal to the ambient background noise level and barely noticeable.

Regardless which steam blow process the applicant chooses, staff proposes a notification process (see proposed Condition of Certification **NOISE-5** below) to make neighbors aware of impending steam blows. This should help ensure the process is at least tolerable to residents.

LINEAR FACILITIES

Construction of the gas line, water lines, and electric interconnection line will produce noise. In a typical greenfield⁶ project, with its linear facilities often many miles in length, construction of these facilities can annoy receptors near the routes. In the case of a repowering⁷ project such as the MLPPP, however, existing linear facilities can often be used, obviating the need for construction of new ones. Such is the case with MLPPP. The existing natural gas lines, electric switchyards and cooling water supply and return facilities will be employed (Duke Energy 1999a, AFC §§ 1.1, 1.2.3, 1.3, 1.4.2, 1.4.4, 1.4.5, 2.1.1.4, 2.2.1, 2.3.3.6, 2.3.3.11, 8.1, 8.3.1.1, 8.5.1.1). Only short connections, located entirely within the Moss Landing Power Plant facility, need be constructed. Construction noise will therefore be similar to that created by construction of the new power plant itself, and thus not likely to annoy neighbors.

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 will protect construction workers, and commits in general to complying with them (Duke Energy 1999a, AFC §§ 1.5.9, 7.5.12; Table 7-1). 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

A typical greenfield power plant, as any other new industrial facility, represents an increase in the local noise regime. The usual noise LORS are crafted to limit this increase in noise to levels that are tolerable to any sensitive receptors. A repowering project, on the other hand, holds a potential advantage in that it may be possible, by replacing old facilities with the new plant, to hold noise impacts on the surrounding community to the same level, or even reduce them. Duke Energy's entire Moss Landing modernization project will, in fact, result in a net reduction in noise impacts on its surroundings.⁸ The work on Units 6 and 7, which includes installing quieter forced draft fans and installing quiet induced draft fans, will cause those units to operate as much as 13 dBA more quietly than is now the case (Duke Energy 1999a, AFC §§ 6.12, 6.12.2.2, 6.12.2.3, 6.12.2.4; Appendix 6.12-1, Table 9). Adding the new noise from the MLPPP will still result in a net decrease in noise impacts on the environment (Duke Energy 1999a, AFC § 6.12; Table 6.12-12).

⁶ "Greenfield" denotes a facility built anew on a previously unused, possibly undisturbed, site.

⁷ "Repowering" is a term used to describe various approaches to modifying or refurbishing an existing power plant, or building a new power plant at an existing power plant facility.

⁸ The decommissioning of Units 1 through 5, which occurred in January 1995, before Duke Energy purchased the facility from PG&E (Duke Energy 1999a, AFC § 2.1), is not included in the modernization project.

The original application included the Units 6 and 7 upgrade as part of the MLPPP (Duke Energy 1999a). In subsequent filings, the applicant separated this work from the project (Duke Energy 1999h, 1999i). This simplifies the noise analysis; originally, the MLPPP may have taken credit for some or all of the noise reduction from the work on Units 6 and 7. Since Units 6 and 7 are no longer part of the MLPPP, and are no longer subject to Energy Commission jurisdiction, noise reductions from the Units 6 and 7 retrofit and upgrade cannot be credited to new noise emissions from the MLPPP.

POWER PLANT OPERATION

The MLPPP will be constructed in a heavily industrialized area. It will be entirely surrounded by the existing Moss Landing Power Plant. Adjacent to the south is the National Refractories processing plant, and to the east is an automobile wrecking yard (Duke Energy 1999a, AFC §§ 1.5.2, 2.3.2, 6.12.1.2).

During its operating life, the MLPPP will represent essentially a steady, continuous noise source day and night. Occasional short-term increases in noise level will occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels will decrease. While the Monterey County General Plan Noise Element requires that “ambient sound levels...be less at night (10 p.m. to 7 a.m.) than during the day” (Monterey 1995, Policy 22.2.5), this is not practicable in the case of a power plant that may operate round the clock. Instead, Energy Commission staff maintain that controlling plant noise emissions to a level that causes no significant adverse impacts on sensitive receptors at night will ensure compliance with the intent of this standard.

The MLPPP will be located within the existing Moss Landing Power Plant, at least 1,500 feet from the facility boundary and 2,200 feet from the nearest sensitive receptor. Due to this relative isolation, the applicant’s computer modeling shows that the project will cause an increase in background noise levels on the surroundings of only 4 dBA, a barely perceptible amount that conforms to Energy Commission staff’s recommended limit of 5 dBA (Duke Energy 1999a, AFC §§ 6.12.2.2; Tables 6.12-10, 6.12-11; Appendix 6.12-1, Tables 6, 8). Additionally, the project will create noise levels less than 85 dBA at 50 feet from the MLPPP site boundary, and noise will not exceed 70 dBA at the Moss Landing Power Plant site boundaries (Duke Energy 1999a, AFC § 6.12.2.2; Tables 6.12-9, 6.12-10, 6.12-11; Appendix 6.12-1, Tables 6, 7, 8). The project is thus projected to comply with all applicable LORS governing community noise exposure.

Should the MLPPP prove to cause noise impacts greater than predicted, the project noise levels could be mitigated by installing additional sound shielding or soundproof enclosures around the noisier equipment.

TONAL AND INTERMITTENT NOISES

One possible source of annoyance would be strong tonal noises, individual sounds that, while not louder than permissible levels, stand out in sound quality. The

applicant predicts that the only tonals sufficiently loud to cause annoyance would be lower frequency tones from the gas turbine exhaust. This noise will be controlled by the installation of tuned silencers on the exhaust stacks. Intermittent noises would be caused chiefly by steam relief valves opening as plant load changes or upon a plant trip. To ensure that adequate measures are taken to mitigate tonal and intermittent noise sources, staff has proposed a Condition of Certification (see **NOISE-6**, below) to ensure that tonal noise and intermittent steam relief noises are not allowed to cause a problem.

If tonals present a problem, the offending equipment could be retrofitted with additional noise shielding or soundproof enclosures. Excessive steam relief noise could be mitigated by installing larger mufflers on the relief stacks.

LINEAR FACILITIES

As discussed above, the project's linear facilities (natural gas, water and electric transmission lines) will all lie within the boundaries of the Moss Landing Power Plant facility. These facilities, once placed in operation, will likely produce no audible noise. The gas and water lines will be silent from any distance. The electric transmission interconnection with the existing PG&E switchyard, on the northern boundary of the facility, will normally be inaudible. A humming from corona effect would occur in rainy or highly humid conditions, but would be practically unnoticeable from within the facility, and completely inaudible from anywhere outside the facility boundary.

WORKER EFFECTS

The applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and commits to comply with applicable LORS (Duke Energy 1999a, AFC §§ 1.5.9, 6.12.2.2, 7.5.12). Areas of the plant with noise levels exceeding 85 dBA (the level below which OSHA does not recognize a threat to workers' hearing) will be posted and hearing protection required. Duke Energy will continue the employee health and safety programs currently in use for employees working on Units 6 and 7, programs that have proven successful in the past.

CUMULATIVE IMPACTS

There are several construction projects planned for the region around the Moss Landing facility, including three housing developments, a golf course, and the renovation and expansion of the Moss Landing Marine Lab (Duke Energy 1999a, AFC § 6.12.2.3). These projects all lie more than two miles from the MLPPP (the golf course and housing developments), or will be completed before work can begin on the MLPPP (the Marine Lab). The only other projects that could produce cumulative noise impacts are the other elements of Duke Energy's modernization project; the oil storage tank demolition, and the Units 6 and 7 retrofit and upgrade. Construction noise from this work will be of the same nature as that from construction of the MLPPP, and the collective noise levels are not expected to reach significant levels.

As discussed above, the Units 6 and 7 upgrade project will include replacement of four old, noise forced draft fans per unit with two new, quieter forced draft fans and

two new, quiet induced draft fans per unit (Duke Energy 1999a, AFC § 6.12.2.2). The resultant noise reduction from these units, when combined with the noise produced by the MLPPP, will result in a net decrease in noise to the surroundings. The net cumulative impact, then, will be beneficial rather than adverse.

FACILITY CLOSURE

Upon closure of the facility, all operational noise will cease; no further adverse impacts from operation will be possible. The remaining potential noise source will be that caused by dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise will be similar to that caused by the original construction of the MLPPP, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the MLPPP will likely be built and operated to comply with all applicable noise laws, ordinances, regulations and standards. Staff further concludes that the MLPPP, mitigated as described above, will likely present no significant adverse noise impacts. In fact, the applicant's concurrent Moss Landing modernization project will likely result in a cumulative noise impact that is beneficial rather than adverse. The MLPPP will likely represent an unobtrusive, nearly undetectable component of ambient noise levels.

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.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of rough grading, the project owner shall notify all residents within one-half mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the 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 phone 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 Construction Report following the start of rough grading a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

NOISE-2 Throughout the construction and operation of the 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 Monterey County Department of Health, Division of Environmental Health, 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 project construction, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to the start of rough grading, the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon request.

NOISE-4 If a traditional, high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the

noise of steam blows to no greater than 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 one-half mile 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 an output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. No single piece of equipment shall be allowed to stand out as a 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 are in excess of 70 dBA at the MLPPP property boundary, 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 Monterey County Department of Health, Division of Environmental Health, 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 offsite 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.

NOISE COMPLAINT RESOLUTION FORM

Moss Landing Power Plant Project
(99-AFC-4)

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).

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NOISE: APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

Noise levels can be measured in a number of ways. One common measurement, the equivalent sound level (L_{eq}), is the long-term A-weighted sound level that is equal to the level of a steady-state condition having the same energy as the time-varying noise, for a given situation and time period. (See NOISE: Table A1, below.) A day-night (L_{dn}) sound level measurement is similar to L_{eq} , but has a 10 dB weighting added to the night portion of the noise because noise during night time hours is considered more annoying than the same noise during the day.

NOISE: Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10} , L_{50} , & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} is generally taken as the background noise level.
Equivalent Noise Level L_{eq}	The 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.	

In order to help the reader understand the concept of noise in decibels (dBA), NOISE: Table A2 has been provided to illustrate common noises and their associated dBA levels.

NOISE: Table A2 Typical Environmental and Industry Sound Levels			
Source and Given Distance from that Source	A-Weighted Sound Level in Decibels (dBA)	Environmental Noise	Subjectivity/ Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		
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 Moss Landing Power Project (MLPP) and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the project with mitigation measures in place will not cause significant adverse visual impacts in the areas identified in this analysis. Significant adverse visual impact will be mitigated to less than significant levels by implementation of mitigation measures (light reflectors, landscape screening, and color treatment at the power plant) identified in this analysis. Also, the project, after mitigation, would not conflict with local policies regarding visual resources that are part of the applicable laws, ordinances, regulations, and standards.

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether the MLPP would 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.

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 compliance of the project with applicable laws, ordinances, regulations, and standards; and
- 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

¹ The California Energy Commission's power plant siting regulations.

visual assessment, and identification of the basis for identifying relevant significance criteria used in evaluating the impacts of the proposed project.

Energy Commission staff considered the following criteria in determining whether a visual impact would be significant.

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:

- a) have a substantial adverse effect on a scenic vista;
- b) substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- c) substantially degrade the existing visual character or quality of the site and its surroundings; or
- d) create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

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.

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?

EVALUATION PROCESS

Energy Commission staff and the applicant's consultant selected eleven Key Observation Points²(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.

ELEMENTS OF THE VISUAL SETTING

To assess the existing visual setting, staff considered the following four elements:

Visual Quality – This is 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 a rural setting such as the proposed project, 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 – This is 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.

² The use of KOPs or similar view locations is common in visual resource analysis. The US Bureau of Land Management and the US Forest Service use such an approach.

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 negligible to dominant or co-dominant.

Contrast – Visual contrast was evaluated 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 tie into the existing electrical grid system, is located on property owned by the applicant, therefore is not subject to federal land management requirements. The project site is on a section of Highway 1 designated as a potential scenic highway, and near Elkhorn Slough, which is designated as a potential scenic waterway in the North County Land Use Plan. Without official designation, no federal or state regulations pertaining to scenic resources for the Elkhorn Slough or Highway 1 are applicable to the project, although the North County Land Use Plan establishes criteria to protect the visual resources in this area, and are listed below under local general plan policies.

LOCAL

Monterey County has specific policies on visual or aesthetic resources that apply to the Moss Landing project. These issues are addressed in the Monterey County Coastal Implementation Plan, Part 1 & 2, and North County Land Use Plan, Local Coastal Program, implemented by the Monterey County Planning Department. The Local Plan provides policies for protection of shoreline view and locations of new structures on the least visually obtrusive portion of a parcel.

Monterey County Coastal Implementation Plan Part I (Title 20, Zoning Ordinance) Chapter 20.28: Regulations for Heavy Industrial Zoning Districts (HI/CZ)

³ Scale contrast is the scale of an object relative to other distinct objects or areas in the landscape.

Section 20.28.070.D: All development shall have landscaping covering a minimum of 10 percent of the site area subject to a plan approved by the Director of Planning. The landscaping shall be in place prior to commencement of use.

Section 20.28.070.E: All exterior lighting shall be unobtrusive, harmonious with the local area, and constructed or located so that only the area intended is illuminated and off-site glare is fully controlled.

Section 20.28.080.A: All equipment and material storage areas shall be screened by solid wall, fences, or by adequate plantings of not less than 6 feet in height.

The Monterey County Coastal Implementation Plan, Part 2: Visual Resources Development Standards include a requirement for onsite inspection by a planner for industrial uses, to determine conformance with policies of the land use and development standards of the Implementation Plan.

The following guidelines specific to visual resources have been developed to protect scenic corridors:

1. The location and siting of structures shall allow for their maximum screening from public view by topography or vegetation and to minimize obstructions of or intrusion of views of the shoreline from public viewing areas.
2. The design of structures, including fencing shall incorporate natural materials, earth-tone colors, and otherwise blend with the rural setting.
3. Landscaping and lighting shall be unobtrusive and blend with the rural setting. Landscaping shall incorporate native plants common to the area.
4. The structures shall be modified for bulk, size, and height where necessary to protect and minimize visibility from the public viewshed.

PROJECT DESCRIPTION

The proposed MLPP involves installation of two, 530-megawatt (MW), natural gas-fired combined cycle units, plus the installation of four exhaust stacks, each 145 feet in height. The project also includes removal of eight existing 225-foot stacks formerly used for units 1 through 5 (retired from service by PG&E in 1995). The project will not require installation of new high-voltage transmission lines, as power from the combined-cycle units will tie into the existing PG&E 230-kV switchyard located immediately north of the power plant, where units 1 through 5 previously connected into the PG&E grid.

SETTING

REGIONAL SETTING

The project is located within the North County region of Monterey County. The site is approximately 12 miles northwest of Salinas, California in Monterey County near the Moss Landing Harbor. The area in which the plant is located includes industrial

facilities, agricultural lands, sparse residences, recreational beaches and tidal wetlands.

The project site is bordered on the west by Highway 1 and Moss Landing Harbor, and on the south by Dolan Road, National Refractories and Moro Cojo Slough, and Elkhorn Slough is to the north.

The area in the vicinity of the MLPP is used primarily for agriculture, open space wildlife habitat, industry and marine-related uses. The most prominent land use in the vicinity is agriculture, including cattle grazing and cropland. Open space wildlife habitat occurs in the areas of the Elkhorn Slough to the north (including the Elkhorn Slough National Estuarine Reserve) and Moro Cojo Slough to the south.

Communities in the project area include Moss Landing, Castroville, and Oak Hills, which are small-unincorporated townships, located along Highways 1 and 58.

The Elkhorn Slough National Estuarine Research Reserve (Reserve) is located four miles east of the MLPP and is managed by the California Department of Fish and Game in cooperation with the National Oceanic and Atmospheric Administration. The 1,400-acre reserve has miles of trails, an interpretative center, and channels for canoeing and float boats for bird and wildlife viewing excursions.

The proposed power plant will be visible from the Reserve; therefore staff has addressed the Reserve in the visual analysis and impact section of this report.

PROJECT AREA SETTING

The project site will be located on a 239-acre parcel located at the intersection of Dolan Road and Highway 1. The plant is situated near the Moss Landing Harbor in an area, which includes industrial facilities, agricultural lands, sparse residences, recreational beaches, and tidal wetlands. Much of the land has been graded; some of the graded areas have been paved, but much of the graded areas have been left with either dirt or gravel surfaces. The only vegetation consists of low-growing annual grasses within the plant site and extensive landscape cover surrounding the perimeter of the property. In addition at the MLPP, the phased removal of fuel storage tanks will be completed under a County demolition permit. This action will considerably reduce the portion of the horizontal field of view occupied by existing industrial facilities.

KEY OBSERVATION POINTS

As provided in the AFC (AFC pg.6.13-20, Section 6.13.2.7), the consultant structured the analysis of the project effects by identifying the view areas most sensitive to the project's potential visual impacts. In consultation with Energy Commission staff, eleven 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. The description of the view from each KOP is located in the OPERATIONS IMPACTS section of the report.

ANALYSIS AND IMPACTS

CONSTRUCTION IMPACTS

Construction for the project site is expected to take about 29 months and would entail the use of heavy construction equipment, the development of a laydown, storage area, and truck traffic. The power plant site is sufficiently far from residences that visual impacts due to construction would not be significant.

The project will not require installation of new high-voltage transmission lines. Instead, power from the combined-cycle units will tie into the existing PG&E 230-kV switchyard located immediately north of the power plant, where Units 1 through 5 of the existing plant connected to the PG&E grid.

Natural gas will be provided by two existing gas distribution lines (20 and 24 inches in diameter) that convey natural gas from the PG&E pressure limiting and regulator station in Hollister, California. Short segments of natural gas distribution lines will be extended to the project. No visual impacts will arise, as any new gas lines constructed will be underground.

The project will utilize three water systems, which are currently in place. Therefore no visual impacts will occur.

Wastewater from the proposed plant will use the existing discharge structure currently used for Units 6 and 7, therefore no visual impacts will occur.

OPERATIONS IMPACTS

Eleven Key Observation Points were selected to be representative of the most critical locations from which the project will be seen. KOP's are often located in an effort to evaluate impacts on visual resources with various levels of sensitivity, in different landscape types and terrain, and from various vantage points. The following KOP locations include (1) along major or significant travel corridors; (2) at key vista points; (3) in proximity to residential uses; and (4) at significant recreational areas.

KEY OBSERVATION POINT 1-VIEW FROM RESIDENTIAL EDGE OF CASTROVILLE

KOP 1(see **VISUAL RESOURCES Figure 2** for location) represents the northwest view from the western residential edge of the community of Castroville. The KOP is located approximately 13,300 feet (2.5 miles) from the proposed new stacks of the MLPP.

**VISUAL RESOURCES Figure 1
Key Observation Points**

Visual Sensitivity

Because of the residences in the area of KOP 1, viewer sensitivity is high.

Visibility

Because of the distance between KOP 1 and the power plant (approximately 2.5 miles), the power plant, including the stacks, will be barely visible, therefore visibility from KOP 1 will be low.

Visual Quality

The view of KOP 1 has the character of an open landscape, predominantly flat, and devoted to agricultural activities. Greenhouses to the right block views to the proposed power plant site for many of the residents. Considering these factors, visual quality is moderate to high.

Viewer Exposure

Approximately 24,500 vehicles per day travel on Highway 156. For travelers on Highway 156, considering the horizon distance and moderate duration of view, viewer exposure is low. The number of residences in the area of Castroville represented by this view (791) is moderate and view duration is high, so viewer exposure is low to moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in regard to form, line, and scale. Scale contrast with existing residences would be low because the power plant would be farther from the view area than the existing homes. The proposed earth tones of the power plant and stacks would contrast moderately with the gray tones of the existing industrial landscape. Contrast with existing residences in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 1 toward the site consist of agricultural land with a small number of trees and green houses in the middle ground. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and the green houses appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would contrast moderately with the green tones of the trees and agricultural fields. Because of the distance of the project from KOP 1, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with vegetation would be low.

Contrast with Land/Water

From KOP 1, the landform is almost flat and forms a horizontal band. No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and

line. Vegetated land surface is visible, so color would be moderate. The project size would appear approximately the same size as the existing Moss Landing Plant, so scale contrast would be low.

Because of the distance of the project from KOP 1, the increment of contrast with land added by the proposed structures would be small, and contrast with land would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 1 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 1 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 1, the project would block a small part of the view of the sky. Existing industrial structures already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impact

It can be concluded that the proposed power plant and stacks will not have a significant impact based on the following summary of visual factors for KOP 1:

- viewer sensitivity is high;
- visual quality is moderate to high ;
- visibility is low;
- viewer exposure is low to moderate;
- the highest levels of contrast would be low.
- scale dominance would be negligible.
- spatial dominance would be co-dominant; and
- view blockage would be negligible.

KEY OBSERVATION POINT 2- VIEW FROM THE BEACH AT PAJARO DUNES

KOP 2 (see **VISUAL RESOURCES Figure 3** for location) represents the view of the proposed power plant from Pajaro Dunes four miles north from MLPP.

Visual Sensitivity

Because the viewers for KOP 2 are primarily the occasional beachcombers, visual sensitivity is considered high.

Visibility

KOP 2 is located on the beach at Pajaro Dunes, with a southeastern view of the power plant with the Pajaro River in the foreground. The proposed power plant stacks will barely be discernable and are slightly taller than the distant trees on the horizon, so visibility from KOP 2 is considered low.

Visual Quality

The view from KOP 2 includes the panoramic view of the beach, dunes, Pajaro River in the foreground, native vegetation along the coastal beach, and trees in the background. Therefore visual quality is considered high.

Viewer Exposure

As provided in the AFC, approximately 565 vacation homes are situated in this area with 10% or 56 of the Pajaro Dunes being occupied year round. The number of residences represented by this view is moderate, the distance is background, and the view duration is long, so viewer exposure is moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures to the east of the project in regard to form, line, and scale. Scale contrast with existing industrial structures in the distance would be low because the power plant would be obscured from the view from existing trees and vegetation along the horizon. Contrast with existing structures in regard to form and line would be low. The proposed earth tone color proposed for the power plant would contrast moderately with the colors of the existing vegetation in the background.

Contrast with Vegetation

Vegetation visible in the view from KOP 2 toward the site consists of Pajaro Dunes with vegetation and a small number of trees in the distance. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a low level of contrast with the sparse vegetation which is generally salt brush. Because of the distance of the project from KOP 2, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with vegetation would be low.

Contrast with Land/Water

From KOP 2, the landform is almost flat and forms a horizontal band. Water is visible in this foreground view of Pajaro River. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with

land in regard to form and line. The proposed earth tone of the proposed project would contrast moderately with the color of the water. Because of the distance of the project from KOP 2, the project size would appear smaller than the coastal hills and the large expanse of water, so scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 2 would be negligible .

SPATIAL DOMINANCE

Because 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 backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 2, the project would block a small part of the view of the sky. Existing trees already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impact

It can be concluded that the proposed power plant and stacks will not have a significant impact based on the following summary of visual factors for KOP 2:

- viewer sensitivity is high;
- visual quality in this area is high;
- visibility is low;
- viewer exposure is moderate;
- the highest levels of contrast would be low;
- scale dominance would be negligible.
- spatial dominance would be co-dominant.; and
- view blockage would be negligible.

KEY OBSERVATION POINT 3- SOUTHWEST VIEW FROM STRUVE ROAD NEAR HIGHWAY 1

KOP 3 (see **VISUAL RESOURCES Figure 4** for location) represents the southwest view of a portion of the proposed power plant viewed from Struve Road near Highway 1. The viewpoint is approximately 2.5 miles from MLPP.

Viewer Sensitivity

The viewers consist of travelers in cars, most which access the beach from Struve Road, and approximately 680 local residents. Overall, visual sensitivity is considered high.

Visibility

The proposed power plant stacks would be slightly visible from this viewpoint for the residents and the travelers. Approximately 680 individuals live within the vicinity of KOP 3 with several obstructed views (trees in the middleground and background) towards the proposed plant site. In addition, because the plant is situated along the coast, fog and haze would frequently obscure the visual perception of the plant. Therefore visibility is considered low.

Visual Quality

The view from KOP 3 encompasses agricultural fields with sporadic trees in the middle ground and background. The view is panoramic and the power plant and stacks would be partially screened by the trees in the middleground and background views. Therefore visual quality is rated moderate.

Visual Exposure

Based on the number of residents and travelers to the state beach (approximately 100 per day), long duration of view and background distance of the KOP, viewer exposure is moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures to the east of the project in regard to form, line, and scale. Scale contrast with existing industrial structures in the distance would be low because the power plant would be obscured from the view by existing trees and vegetation along the horizon. The proposed earth tone color proposed for the power plant would contrast moderately with the colors of the existing structures. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 3 toward the project site consists of agricultural row crops with a small number of trees in the middleground and on the horizon. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the green color tones of the agricultural fields. Because of the distance of the project from KOP 3, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with vegetation would be low.

Contrast with Land/Water

From KOP 3, the landform is flat and forms a horizontal band. There is no water visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. The project size would appear approximately the same size as the existing trees in the horizon, so scale contrast would be low.

Because of the distance of the project from KOP 3, the increment of contrast with land added by the proposed structures would be small, and contrast with land would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 3 would be negligible .

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 3 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 3, the project would block a small part of the view of the sky. Existing trees already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impact

It can be concluded that the proposed power plant and stacks will not have a significant impact based on the following summarization of visual factors for KOP 3:

- viewer sensitivity is high;
- visual quality in this area is moderate;
- visibility is low;
- viewer exposure is moderate;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be co-dominant; and
- view blockage would be negligible.

KEY OBSERVATION POINT 4- WEST VIEW FROM ELKHORN OBSERVATION POINT

KOP 4 (see **VISUAL RESOURCES Figure 5** for location) represents the western view from Elkhorn Slough Observation Point near the visitor's center. As described in the AFC, the center is at the nearest edge of the rolling coastal hills, where the elevation and angle provide a direct view of Elkhorn Slough and MLPP. The viewpoint is approximately three miles from MLPP.

Visual Sensitivity

Because the viewers from this KOP will predominantly be tourist and local wildlife and natural area enthusiast, visual sensitivity is considered high.

Visibility

Visibility from the KOP is considered low to moderate based on the trees in the horizon that will screen a major portion of the project from view. The occurrence of fog and haze will also provide a camouflaging effect to the proposed plant.

Visual Quality

The view from KOP 4 is panoramic across Elkhorn Slough and the habitat areas. The terrain in this area is flat to slightly rolling. The vegetation is low grasses and shrubs, and the trees along the north side of the power plant site. An existing electrical transmission line is in the middleground. The proposed power plant appears small on the horizon. Considering these factors, visual quality is moderate to high for KOP 4.

Visual Exposure

The proposed power plant will be visible to approximately 125 visitors on per day, at the visitor's center. Considering the distance from the KOP to the proposed power plant, the moderate number of viewers, and the moderate duration of view, visual exposure for KOP 4 is low to moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures to the west of the project in regard to form, line, and scale. Scale contrast with existing industrial structures in the distance would be low because the power plant would be obscured from the view from existing tanks and vegetation along the horizon. Contrast with existing structures in regard to form and line would be low. The proposed earth tone color proposed for the power plant would contrast moderately with the colors of the existing structures.

Contrast with Vegetation

Vegetation visible in the view from KOP 4 toward the project site consist of habitat areas with a small number of trees in the foreground and in the horizon. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the green and tan color tones of the habitat area. Because of the distance of the project from KOP 4, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with existing vegetation would be low.

Contrast with Land/Water

From KOP 4, the foreground and middleground is composed of water from Elkhorn Slough and rolling coastal hills. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. The proposed earth tone of the project would contrast moderately with the color of the rolling hills and vegetation. The project size would appear approximately the same size as the existing trees in the horizon, so scale contrast would be low.

Because of the distance of the project from KOP 4, the increment of contrast with land added by the proposed structures would be small, and contrast with existing land would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 4 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 4 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 4, the project would block a small part of the view of the sky. Existing trees already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant and stacks will not have a significant impact based on the following summarization of visual factors for KOP 4:

- viewer sensitivity is high;
- visual quality in this area is moderate to high;
- visibility is low to moderate;
- viewer exposure is low to moderate;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be co-dominant; and
- view blockage would be low.

KEY OBSERVATION POINT 5- NORTHEAST VIEW FROM SALINAS RIVER STATE BEACH PARKING AREA

KOP 5 (see **VISUAL RESOURCES Figure 6** for location) represents the northeast view of the proposed plant site from the Salinas State Beach parking area. The ocean dunes are to the left of the photo with the Salinas River in the foreground. On the hill is the new Moss Landing Marine Laboratory currently under construction, and the Moss Landing harbor is in front of the existing power plant.

Visual Sensitivity

Because the viewers from this KOP consist primarily tourist and local nature enthusiasts, visual sensitivity is considered high.

Visibility

Because the view of the proposed plant site is mostly obscured by the industrial landscape of National Refractories, visibility is considered low to moderate.

Visual Quality

The view from KOP 5 takes in the now under construction Moss Landing Marine Laboratory, the National Refractory industrial site, and the existing power plant. Because of the presence of pre-existing commercial and industrial infrastructures, visual quality is considered low.

Visual Exposure

On average, approximately 178 visitors arrive at the state beach with an estimated 800 vehicles during peak days. Visitor counts to the State Park are estimated at approximately 64,000 per year. For visitors, the number of viewers is moderate and the view duration is moderate. Considering these factors, viewer exposure is moderate for KOP 5.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures to the foreground and middleground in regard to form, line, and scale. The earth tone color proposed for the power plant would contrast moderately with the colors of the existing structures. Scale contrast with existing industrial structures in the distance would be low because the power plant would be obscured from the view from the existing power plant and the industrial landscape of the area. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 5 toward the project site consists of natural grasses and coastal rolling hills with a small number of trees in the foreground and in the horizon. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. In addition, the proposed earth tones of the power plant stacks would cause a moderate level of contrast with the green and tan color tones of the rolling hill's terrain. Because of the distance of the project from KOP 5, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with existing vegetation would be low.

Contrast with Land/Water

From KOP 5, the landforms are flat with some coastal rolling hills. No water is visible in this view. Because the project elements would be predominantly vertical

and angular, the project would cause high contrast with land in regard to form and line. However, because the project structures would appear similar in size to the existing industrial landscape, scale contrast would be negligible.

Because of the distance of the project from KOP 5, the increment of contrast with land added by the proposed structures would be small, and contrast with existing land would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 5 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 5 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 5, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 5:

- visual sensitivity is high;
- visual quality is low;
- visibility is low to moderate;
- viewer exposure is moderate;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be co-dominant ; and
- view blockage would be negligible.

KEY OBSERVATION POINT 6- NORTHWEST VIEW FROM INTERSECTION OF SANDHOLDT ROAD AND HIGHWAY 1

KOP 6 (see **VISUAL RESOURCES Figure 7** for location) represents the view toward the north of the proposed plant site from the intersection of Sandholdt Road and Highway 1. Highway 1 turns directly toward the power plant with a rural store,

residential area and cemetery to the left of KOP 6 being the features of visual interest within the vicinity.

Visual Sensitivity

Because the viewers from this KOP are primarily travelers on Highway 1 composed of tourists and local workers, visual sensitivity is considered moderate to high.

Visibility

Because the view of the proposed plant site is partially obscured by the industrial landscape of National Refractories and the existing power plant, visibility is considered low to moderate.

Visual Quality

The view from KOP 6 to the north takes in the National Refractory industrial site and the existing power plant. Because of the presence of pre-existing commercial and industrial infrastructures, visual quality is considered low.

Visual Exposure

This KOP represents approximately 73 residential homes, and on average approximately 200 visitors arrive at the Salinas River State Beach with an estimated 800 vehicles during peak days. In addition, approximately 24,500 vehicles per day travel north and south on Highway 1. Considering view duration is moderate for visitors, the middleground distance of the proposed power plant and obstructed view from pre-existing industrial uses, viewer exposure is low to moderate. For residences, the number of viewers is moderate and the view duration is long, so viewer exposure is moderate to high.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures in the distance would be low because the power plant would be smaller than the existing power plant and the National Refractories facility. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 6 toward the project site consist of agricultural fields with a small number of trees in the foreground and in the horizon. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the green and tan color tones of the agricultural fields and surrounding fallow lands. Because of the distance of the project from KOP 6, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with existing vegetation would be low.

Contrast with Land/Water

From KOP 6, the landforms are flat and forms a horizontal band. No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. The proposed earth tone of the project would contrast moderately with the color of the existing landforms that are generally green and tan in nature. Because the project structures would appear similar in size to the existing industrial landscape, scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 6 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 6 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 6, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summarization of visual factors for KOP 6:

- visual sensitivity is moderate to high;
- visual quality is low;
- visibility is low to moderate;
- viewer exposure is low to moderate for visitors and moderate to high for residences;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be co-dominant ; and
- view blockage would be low.

KEY OBSERVATION POINT 7- NORTHWEST VIEW FROM DOLAN ROAD WITH TANKS IN FOREGROUND

KOP 7 (see **VISUAL RESOURCES Figure 8** for location) represents the northwest view of the proposed plant site from Dolan Road with the oil storage tanks in the

middle ground. Although the applicant has indicated their intent to remove the existing storage tanks, this proposal is under a separate action with the County, and the visual effect is not considered in this evaluation. The rail spur is to the left of the photo, paralleled by Dolan Road.

Visual Sensitivity

Because the viewers from this KOP are primarily local residents and travelers to Elkhorn Slough, visual sensitivity is considered high.

Visibility

From viewers on Dolan Road, the existing oil storage tanks and trees obscure the view of the proposed power plant with the exception of the upper portion of the stacks, therefore visibility low to moderate.

Visual Quality

The view from KOP 7 takes in the view of the existing power plant, abandoned oil tanks and electrical transmission lines in the middleground. With the removal of the eight, 225-foot tall stacks, a visual benefit will result, although the new stacks will appear to be in the same location as the old stacks. Because of the presence of pre-existing industrial infrastructure, visual quality is considered low.

Visual Exposure

On average, approximately 125 visitors drive along Dolan Road to the Elkhorn Slough habitat area per day. Approximately 1,785 daily vehicle trips occur along Dolan Road. For travelers, the number of viewers is moderate and view duration is short. Considering these factors, viewer exposure is low to moderate for KOP 7.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures would be low because the power plant would be smaller than the existing power plant. The proposed earth tone color of the power plant would contrast moderately with the gray tones of the existing industrial landscape. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 7 toward the project site consists of grazing lands with a small number of trees in the middleground and in the background. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the tan color tones of the grazing lands. Because of the distance of the project from KOP 7, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with existing vegetation would be low.

Contrast with Land/Water

From KOP 7, the landforms are flat and forms a horizontal band. No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. However, because the project structures would appear similar in size to the existing industrial landscape, scale contrast would be low. The proposed earth tone of the project would contrast moderately with the color of the existing landforms, so scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 7 would be low.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 7 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 7, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 7:

- visual sensitivity is high;
- visual quality is low;
- visibility is low to moderate;
- viewer exposure is low to moderate;
- the highest levels of contrast would be low;
- scale dominance would be low;
- spatial dominance would be co-dominant; and
- view blockage would be low.

KEY OBSERVATION POINT 8- SOUTHEAST VIEW FROM HIGHWAY 1 NEAR BRIDGE OVER ELKHORN SLOUGH

KOP 8 (see **VISUAL RESOURCES Figure 9** for location) represents the southeast view from Highway 1 near the bridge over Elkhorn Slough. Large vegetative screening buffers the visual impact of the power plant from the highway.

Transmission towers are visible to the left, and the Salinas River and the harbor are to the right. Highway 1 is the largest element of the view as it heads directly toward the power plant.

Viewer Sensitivity

Because the viewers from this KOP are primarily tourists on Highway 1 as well as local workers, visual sensitivity is considered moderate to high.

Visibility

The view of the proposed plant site is obscured by the vegetative landscape adjacent to MLPP's property line, so visibility is low.

Visual Quality

The view from KOP 8 along Highway 1 is southeast that takes in the existing power plant, the highway, the large native vegetative screening buffers and the proposed power plant. Overall, visual quality is low.

Visual Exposure

On average, approximately 18,000 vehicles travel southbound on Highway 1 on a daily basis and viewer duration is moderate due to the existing screening. Considering the middleground distance of the proposed power plant, viewer exposure is low for KOP 8.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures would be low because the power plant would be obscured from the view from the existing trees. The proposed earth tone of the project would contrast moderately with the color of the existing structures. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 8 toward the project site consist of trees in the middleground. The project is not visible from this view due to the tree cover, so the project would cause low contrast with vegetation in regard to form and line. Because the project cannot be seen from KOP 8, the increment of contrast with vegetation added by the proposed structures would be negligible.

Contrast with Land/Water

From KOP 8, the landforms are flat with trees and various vegetation in the middleground. The highway is the largest element of the view with the Salinas River and Harbor to the right. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. However, because the project structures are obscured by the existing vegetation, scale contrast would be negligible. The proposed earth

tone of the project would contrast moderately with the color of the existing landforms, so color contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. In addition, almost the entire power plant project is screened from view. Therefore, scale dominance from KOP 8 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 8 is panoramic, the project would be subordinate in regard to composition. Because only a small portion of the project would be visible from this view, spatial dominance in regard to backdrop would be negligible. The overall spatial dominance rating would be negligible.

VIEW BLOCKAGE

From KOP 8, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summarization of visual factors for KOP 8:

- visual sensitivity is moderate to high;
- visual quality is low;
- visibility is low ;
- viewer exposure is low ;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be negligible; and
- view blockage would be low.

KEY OBSERVATION POINT 9- SOUTHEAST VIEW FROM MOSS LANDING STATE BEACH AT ELKHORN SLOUGH INLET

KOP 9 (see **VISUAL RESOURCES Figure 10** for location) represents the southeast view of the proposed plant site from the Moss Landing State Beach at the Elkhorn Slough Inlet. The applicant's proposal to remove the eight, 225-foot stacks and the visual effects are considered in this evaluation. Moss Landing Harbor is in the middleground to the right of the power plant.

Visual Sensitivity

Because the viewers from this KOP are tourists and local nature enthusiasts consist, visual sensitivity is considered high.

Visibility

The existing vegetation and existing power plant totally screens the proposed power plant and the existing PG&E switch yard, resulting in no visibility.

Visual Quality

The view from KOP 9 takes in the view of the existing power plant, which is in the middleground. Because of the presence of pre-existing commercial and industrial infrastructures, visual quality is considered low.

Visual Exposure

There is one residential viewer from this KOP and visitor counts to the State Park are estimated at approximately 191 per day. On average, there are approximately 191 visitors to the Moss Landing State Beach, and approximately 800 vehicles per peak day (AFC pg. 6.13-50). Considering the middleground distance of the proposed power plant and obstructed view due to pre-existing industrial uses, viewer exposure is nonexistent. Considering these factors, viewer exposure is none for KOP 9.

Contrast

The proposed power plant would be obscured from view from the existing trees therefore contrast with structures, vegetation, land and water would be none.

SCALE DOMINANCE

The project is not visible from this view, therefore, scale dominance from KOP 9 would be none.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 9 is panoramic, the project would be subordinate in regard to composition. Because there are no visible portions of the project from this view, spatial dominance in regard to backdrop would be none. The overall spatial dominance rating would be none.

VIEW BLOCKAGE

From KOP 9, the existing industrial landscape blocks the view of the project so change that would be caused by the project would not be substantial. Therefore, view blockage would be none.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 9:

- visual sensitivity is high;
- visual quality is low;
- visibility is none;
- viewer exposure is none ;

- the highest levels of contrast would be none;
- scale dominance would be none;
- spatial dominance would be none; and
- view blockage would be none.

KEY OBSERVATION POINT 10- NORTHEAST VIEW FROM ANTIQUE AREA ON MOSS LANDING ROAD

KOP 10 (see **VISUAL RESOURCES Figure 11** for location) represents the northeast view from the antique area on Moss Landing Road to the proposed plant site. The existing power plant is to the left. Commercial businesses are in the foreground, and the National Refractories facilities are to the right in the middleground.

Visual Sensitivity

Because the viewers from this KOP are mostly tourists with some residents, visual sensitivity is considered high.

Visibility

The existing National Refractories' largest building, in the middle of the view, obscures the view of the proposed power plant, except for the tops of the stacks. Therefore, visibility is low.

Visual Quality

The view from KOP 10 takes in the view of the existing power plant and stacks in the middleground. Because of the presence of pre-existing commercial and industrial infrastructures, visual quality is considered low.

Visual Exposure

On average, approximately 33 people live nearby either in scattered housing within the harbor area or within boats docked at the harbor slips. Approximately 300 parking spaces are available for visitors in the area of the harbor, which are generally full during the weekends. Because residences and tourist are represented by this KOP, duration of view long. Considering the middleground distance of the proposed power plant, the number of viewers, and the long duration of view, viewer exposure is moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures would be low because the power plant would be obscured from the view from the existing industrial landscape. The proposed earth tone of the project would contrast moderately with the color of the existing industrial landscape. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 10 toward the project site consist of scattered trees and vegetation in the foreground. The project stacks are barely visible from this view due to the industrial nature of the area, so the project would cause low contrast with vegetation in regard to form and line. Because the project is barely seen from KOP 10, the increment of contrast with vegetation added by the proposed structures would be insignificant , and contrast with existing vegetation would also be low.

Contrast with Land/Water

From KOP 10, the landforms are flat with scattered trees and various vegetation in the foreground . No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. However, because the project structures are obscured by the existing industrial development, scale contrast would be negligible. The proposed earth tone of the project would contrast moderately with the color of the existing land. The project size would appear as a minor element than that of the major land elements in the view, so scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 10 would be low.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 10 is panoramic, the project would be subordinate in regard to composition. Because the tops of the stacks are barely discernable, spatial dominance in regard to backdrop would be insignificant. The overall spatial dominance rating would be negligible.

VIEW BLOCKAGE

From KOP 10, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 10:

- visual sensitivity is high;
- visual quality is low;
- visibility is low to moderate;
- viewer exposure is moderate;
- the highest levels of contrast would be low ;

- scale dominance would be negligible;
- spatial dominance would be negligible; and
- view blockage would be negligible.

KEY OBSERVATION POINT 11- NORTHEAST VIEW FROM MOSS ISLAND WITH HARBOR AREA IN FOREGROUND

KOP 11 (see **VISUAL RESOURCES Figure 12** for location) represents the northeast view from Moss Island with the harbor area in the foreground. The view is from the pier with water and other piers in the foreground. Boats docked in the slips are in the middleground with the industrialized areas of the power plant and the National Refractories buildings are on the horizon.

Visual Sensitivity

Because the viewers from this KOP is mostly tourists, visual sensitivity is considered high.

Visibility

The new stacks for the proposed power plant appear above the horizon, but below the tops of the boat masts. There are some trees which partially block views of the proposed plant. Visibility from this KOP is low.

Visual Quality

KOP 11 takes in the view of the existing power plant, Moss Landing Harbor in the foreground and the National Refractories in the horizon. The water provides visual value for views from boats in the marina, but due to the existing industrial development in the view, visual quality is reduced to moderate.

Visual Exposure

Approximately 8 people live in this area which will have a view of the power plant stacks in the horizon. In addition approximately 1,500 daily vehicle trips occur along this stretch of the harbor. The view duration for commercial boaters is long and casual boaters is short therefore overall viewer exposure is moderate. The eight residences represented by this view is small and duration of view is long, therefore overall viewer exposure is moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures would be low because the power plant would be obscured from the view from the existing industrial landscape. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 11 toward the project site consist of scattered trees and vegetation in the middleground. The project stacks are barely visible from this view due to the industrial nature of the area, so the project would

cause low contrast with vegetation in regard to form and line. Because the project is barely seen from KOP 11, the increment of contrast with vegetation added by the proposed structures would be low.

Contrast with Land/Water

From KOP 11, the landforms are flat with scattered trees and various vegetation in the middleground. Water is visible in this view from the marina. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. However, because the project structures are obscured by the existing industrial development, scale contrast would be negligible. The proposed earth tone of the project would contrast moderately with the color of the existing land. The project size would appear approximately the same size as the existing industrial and commercial nature of the area in the foreground and middleground, so scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 11 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 11 is panoramic, the project would be subordinate in regard to composition. Because the top of the stacks are barely discernable, spatial dominance in regard to backdrop would be insignificant. The overall spatial dominance rating would be negligible.

VIEW BLOCKAGE

From KOP 11, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impacts

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 11:

- visual sensitivity is high;
- visual quality is moderate;
- visibility is low;
- viewer exposure is moderate ;
- the highest levels of contrast would be low ;
- scale dominance would be low;
- spatial dominance would be negligible; and

- view blockage would be negligible.

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 condition of certification to reduce the lighting impacts to less than significant.

VISIBLE PLUMES

Visible plumes occur when air saturated with water vapor is cooled below its condensation point or when two masses of different temperatures and saturated with water vapors are mixed. The warm, highly saturated plumes leaving the wet cooling tower would be visible during periods of high humidity and low ambient air temperature, which provide optimum conditions for plume formation. Wet cooling towers also typically require significant land area and can be very tall structures, thus creating further visual impacts. For this project, the applicant has decided not to employ cooling towers. The proposed combined-cycle facility exhaust gas is routed through a steam generator or boiler to recover additional energy, creating steam that is used to drive a turbine/generator. The heat rejection system uses once-through ocean cooling.

The generating facility would release flue gas to the atmosphere from the HRSG stacks. The hot combustion gases from the stacks would rarely be visible. According to Energy Commission Air Quality staff, considering the warm and hot start-ups throughout the year, no visible vapor plume should occur. With the infrequent cold start-ups (2-3 times per year), a brief white vapor (water vapor condensation from the exhaust) may be visible from the exhaust stacks. The plume should be inconspicuous and not cause a significant adverse visual impact. Because of the once-through cooling with ocean water, there will be no cooling towers or plumes typically associated with them.

CUMULATIVE IMPACTS

The proposed power plant would add a noticeable but not considerable increment to the existing industrial character of the Moss Landing area. As addressed in the AFC and discussed in staff's analysis, the applicant is proposing major improvements to the existing power plant facilities. The major improvement will be the removal of eight, 225-foot tall stacks, and the eventual phased removal of fuel storage tanks which will be completed under a County permit (demolition permit).

These actions will considerably reduce the portion of the horizontal field of view occupied by MLPP and the existing power plant. The tanks will no longer occupy the ridgeline seen from the Elkhorn Slough Visitor Center (KOP 4). The tank removal will improve the character of the landscape north of Dolan Road, as seen in KOP 7. The removal of these tanks and of the eight, 225-foot tall stacks will have important positive cumulative visual effects. In addition, the existing and proposed

power plants will be outfitted with modernized lighting to control upward glare. There are no proposed or planned land use developments within a 1-mile radius of the MLPP. As discussed in the AFC, there are a few developments planned within a 5-mile radius of Moss Landing. Two of the projects are anticipated to be completed prior to start of construction of the MLPP. The Moro Cojo Subdivision is anticipated to be completed in January 2000 and the renovation of the Moss Landing Marine Lab was scheduled for completion in November 1999.

As discussed in the AFC (pg.6.13-60) the applicant proposes various improvements to the current power plant such as:

- Removal of eight, 225-foot tall stacks
- Phased removal of fuel storage tanks under a County level permit
- The upgrade of Units 6 and 7 and the installation of Selective Catalytic Reduction

The evaluation of the eleven KOP's demonstrates that some views of MLPP will be improved, although a few may be partially occupied by the new units. Because most viewers will see a measured improvement, the overall visual assessment is positive.

In conclusion, the proposed power plant would not contribute substantially to a significant cumulative visual impact.

FACILITY CLOSURE

INTRODUCTION

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

PLANNED CLOSURE

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The closure plan that the project owner is required to prepare should address removal of the power plant structures and the transmission lines 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 lines to reduce visual impacts.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

LOCAL

COUNTY OF MONTEREY

The applicant will 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 Part 2 of the Monterey County Coastal Implementation Plan. Once available, the applicant will send a copy of the landscape plan to Monterey County for review and the Energy Commission for review and approval. Staff recommends the adoption of a condition of certification to ensure that the landscape plan and its implementation satisfy the requirements of the Monterey County Coastal Implementation Plan.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

SPECIFIC MITIGATION MEASURES

The Applicant has proposed three mitigation measures "to make the project more aesthetically acceptable" (MLPP 1999, p.6.13-61):

- All structures, stacks, buildings, and tanks will be constructed of materials that restrict glare, and will be finished with flat, earth tones that will blend with the surrounding environment.
- Lighting at the power plant site will be taken into account in the layout and design of the project.
- Many berms currently exist at the site. Those around the perimeter are to remain, since they are vegetated and will provide screening for the new plant. Fill generated from the removal of berms on the interior can be used to create new berms between the new plant and Dolan Road for additional screening.

EFFECTIVENESS OF THE APPLICANT'S PROPOSED MITIGATION MEASURES

The Applicant's proposed mitigation measures will act to reduce the potential significance of visual impacts associated with the generation project. Extensions of these measures and other measures, as proposed below by Energy Commission staff, will ensure that visual impacts will be minimized.

STAFF'S PROPOSED ADDITIONAL MITIGATION

STAFF MITIGATION 1 (CONDITION 1)

A specific painting plan 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 precolored components of buildings, structures and linear facilities can have colors approved and included in bid specifications for such buildings or structures.

STAFF MITIGATION 2 (CONDITION 2)

As indicated in the Monterey County Coastal Implementation Plan Part 1 and 2, material storage areas shall be screened by solid walls, fences, or adequate plantings. Staff has provided a condition of certification which requires non-reflective and screened fencing to insure compliance with the requirements of the zoning ordinance.

STAFF MITIGATION 3 (CONDITION 3)

A specific lighting plan is needed to ensure that project lighting will be adequately designed, shielded, and placed so as to minimize off-site light and glare. This plan should also minimize backscatter to the nighttime sky, and should include provisions to minimize lighting of plant areas, consistent with operational and safety needs. A procedure is also needed to resolve any lighting complaints.

STAFF MITIGATION 4 (CONDITION 4)

A specific landscaping plan should be prepared showing the location of landscaping, the varieties and sizes of plants proposed to be used, and the proposed time to maturity for proposed plants.

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.

In addition, the removal of eight intermediate 225-foot tall stacks from the existing power plant and additional landscaping around the perimeter of the property represents an overall visual improvement.

As discussed in the visual plume section, with the infrequent cold start-ups (2-3 times per year), a brief white vapor (water vapor condensation from the exhaust) may be visible from the exhaust stacks. Because of the use of once-through cooling with ocean water, there will be no cooling tower or vapor plume typically associated with them. Therefore, staff does not anticipate a significant adverse visual impact.

RECOMMENDATION

The Energy Commission should adopt the following conditions of certification if it approves the project.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Prior to the start of commercial operation, the project owner shall treat the project structures visible to the public in a non-reflective color to blend with the surrounding environment. The project owner shall treat the exhaust towers with a heat-resistant color that minimizes contrast and harmonizes with the surrounding environment.

Protocol: The project owner shall submit a treatment plan for the project to Monterey County for review and comment and to the California Energy Commission Compliance Project Manager (CPM) for final 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.

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.

The project owner should not specify the treatment of 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.

The project owner shall notify the CPM within one week after all precolored structures has been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.

Verification: Not later than 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.

Not less than thirty (30) days prior to the start of commercial operation, the project owner shall notify the CPM that all structures treated during manufacture and all new 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 The Energy Commission recognizes that fencing will be used for a variety of purposes on the Moss Landing site. The perimeter fence will be planted with vines according to the landscape plan (VIS-4). Internal fences required for animal control will be designed specifically for that purpose. Some internal safety fencing will be left open for surveillance purposes. Fencing used for screening shall be non-reflective and shall have slats to provide sufficient screening. Prior to ordering the fencing, the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting the characteristics of all fencing types.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

Verification: At least 30 days prior to ordering the 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 15 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, for the proposed power plant, 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:

- 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;
- 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
- 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.
- 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 prior to start of construction, 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.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection.

VIS-4 Prior to the start of commercial operation, the project owner shall implement a landscape plan that meets the requirements of the Monterey County Zoning Code.

- a. The project owner shall submit the final planting plan to Monterey County for review and comment and to the CPM for review and approval. The project owner shall request confirmation from the County that the planting plan conforms to Monterey County's Zoning Code. The project owner shall submit this conformation to the CPM. The plan shall include, but not be limited to:
 - a detailed landscape plan, at a reasonable scale, which includes a list of proposed tree and shrub species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives.
 - maintenance procedures, including any needed irrigation; and
 - a procedure for replacing unsuccessful plantings.

- b. The trees and shrubs shall not be planted before the plan is approved. The project owner shall notify the CPM and the County when the trees and shrubs have been planted and are ready for inspection.

Verification: At least ninety (90) days prior to the start of commercial operation, the project owner shall submit the proposed landscape plan to Monterey County for review and comment and 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 notify the CPM in the next Monthly Compliance Report following completion of the proposed planting that the planting is ready for inspection.

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ATTACHMENT 1

LIGHTING COMPLAINT RESOLUTION FORM

MOSS LANDING POWER PROJECT Monterey 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 through 12

**VISUAL RESOURCES Figure 2
KOP 1**

**VISUAL RESOURCES Figures 3
KOP 2**

**VISUAL RESOURCES Figure 4
KOP 3**

**VISUAL RESOURCES Figure 5
KOP 4**

**VISUAL RESOURCES Figure 6
KOP 5**

**VISUAL RESOURCES Figure 7
KOP 6**

**VISUAL RESOURCES Figure 8
KOP 7**

**VISUAL RESOURCES Figure 9
KOP 8**

VISUAL RESOURCES Figure 10
KOP 9

VISUAL RESOURCES Figure 11
KOP 10

**VISUAL RESOURCES Figure 12
KOP 11**

VISUAL RESOURCES APPENDIX B
Commission Staff's Visual Assessment Methodology Visual Resources
Appendix B - Commission Staff's Visual Assessment Methodology

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 that a project should 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 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, 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				
	Extreme	Strong	Moderate	Weak	Negligible
SEVERITY FACTOR					
CONTRAST					
Color Contrast		High Or	Medium Or		Low or
Form Contrast		High Or	Medium Or		Low or
Line Contrast		High Or	Medium Or		Low or
Texture Contrast			High Or	Medium or	Low or
Scale Contrast			High or	Medium or	Low or
DOMINANCE					
Scale	Dominant	Co-Dominant Or	Subordinate Or		Insignificant 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.

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CULTURAL RESOURCES

Testimony of Deborah K. B. McLean

INTRODUCTION

This analysis discusses cultural resources that 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 resources 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 will result in 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 history and heritage. Critical to the analysis of cultural resources are the spatial relationships between an undisturbed cultural resources 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 resources 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 Moss Landing Power Plant (MLPP) is required by Section 106 of the National Historic Preservation Act, the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Unless recommendations are adhered to, impacts to cultural resources may result either directly or indirectly during preconstruction, construction, or operation of the project. Cumulative impacts may be associated with the proposed project, and other projects in the same area of similar size and requirements.

In California, many cultural resources sites are already known, and the records and maps for these sites are on file at the regional Archaeological Information Center of the California Historical Resources Information System located throughout the state. Some of the known resource sites have also been designated as State Historic Landmarks and others have been listed on the National Register of Historic Places (NRHP). However, many areas of the state have not been fully explored or mapped and there are cultural resources and sites that remain undiscovered. The potential for the project to affect both known and unknown resources is addressed in this

analysis. For this analysis, three aspects of cultural resources are addressed: prehistoric archaeological resources, historic archaeological resources, and ethnographic resources.

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and/or use of an area. These resources, commonly referred to as sites, may include cultural deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 10,000 years ago and extended into the 18th century when the first Euro-American explorers settled in California.

Historic archaeological resources are those usually associated with Euro-American exploration and settlement, and the beginning of a written historic record; these sites may include archaeological deposits, structures, traveled ways, artifacts, documents, or other evidence of human activity. Under federal and State requirements, cultural resources must be greater than 50 years old to be considered of potential historical importance.

Ethnographic resources are those important to the heritage of a particular ethnic or cultural group, such as Native Americans, African, European, or Asian immigrants. These resources may include traditional resource collecting areas, ceremonial sites, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, 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 Register 48 44739-44738 190 September 30, 1983: Federal Guidelines for Historic Preservation Projects: The U.S. 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 requires federal agencies to take into account the effects of their undertakings on historic properties through consultation 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 (NHRP). The eligibility criteria and the process are used by federal, state, and local agencies in the evaluation of the significance of cultural resources. Similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California Register of Historic Resources (CRHR). Recent revisions to section 106 in 1999 have emphasized the importance of Native American consultation.
- Executive Order 11593, "Protection of the Cultural Environment," May 13, 1971, (36 CFR 8921) orders the protection and enhancement of the cultural environment by 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 (NAGPRA)(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) "historic resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript that 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 historic resource would be impaired.
- Public Resources Code, section 5024.1 establishes a California Register of Historic Resources (CRHR); 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 archaeological or paleontological 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 5097.94 and section 5097.98 define 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. CEQA: This act requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code, section 2183.2 states that, if a project may affect a resource that has not met the definition of an historic 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 Environmental Impact Report (EIR) shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they cannot be avoided, mitigation measures shall be required. The law also discusses excavation as mitigation; discusses 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 an “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: subsection (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of an historic resource. Subsection (b) discusses mitigation through avoidance of damaging effects on any historic 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 Regulations, section 15064.5 “Determining the Significance of Impacts to Archaeological and Historic Resources.” Subsection (a) defines the term “historic resources.” Subsection (b) explains when a project may be deemed to have a significant effect on historic resources and defines terms used in describing those situations.

Subsection (c) describes CEQA's applicability to archaeological sites and provides a bridge between the application of the terms "historic resources" and "unique archaeological resources."

- 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 paleontological 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.
- Health and Safety Code, section 7050.5 states that if human remains are encountered, no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the descendant may inspect the site of the discovery. The descendant shall complete the inspection within 24 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

LOCAL

MONTEREY COUNTY

GENERAL PLAN

To encourage the conservation and identification of Monterey County's archaeological resources, the County will: 1) identify and conserve important representative and unique archaeological sites and features; and 2) encourage various historical and educational societies or other appropriate organizations in their efforts to improve the public's recognition of its cultural heritage and the citizens' responsibilities for archaeological or cultural resources preservation. These objectives will be accomplished through the following:

- The County shall take such action as necessary to compile information on the location and significance of its archaeological resources so this information may be incorporated into the environmental or development review process;
- The Archaeological Sensitivity Zones map shall be used, along with whatever other data is appropriate, to evaluate whether archaeological resources are threatened by proposed development projects. The map shall be updated continuously as new data become available.

- All proposed development, including land divisions, within high sensitivity zones shall require an archaeological field inspection prior to project approval;
- All major projects (i.e., 2.5 acres or more) that are proposed for moderate sensitivity zones, including land divisions, shall require an archaeological field inspection prior to project approval;
- Projects proposed for low sensitivity zones shall not be required to have an archaeological survey unless specific additional information has been obtained to suggest that archaeological resources are present;
- Where development could adversely affect archaeological resources, reasonable mitigation procedures shall be required prior to project approval; and
- All available measures, including purchase of archaeological easements, dedication to the County, tax relief, purchase of development rights, consideration of reasonable project alternatives, etc., shall be explored to avoid development on sensitive archaeological sites (Monterey County, 1982a, pp. 29-30).

NORTH COUNTY LAND USE PLAN, LOCAL COASTAL PROGRAM

The Coastal Act was passed by the State Legislature and became effective on January 1, 1977. The Act established a framework for resolving conflict among competing uses for coastal land and placed its highest priority on the preservation and protection of natural resources. Local government carries out the goals and policies of the Act. Monterey County is divided into four zones. The MLPP is in the area addressed by the North County Land Use Plan (Plan).

KEY POLICY

- Key policies of the Plan include the maintenance and protection of archaeologically sensitive areas, whether or not they have been surveyed and mapped. New land use will be considered compatible with the Plan's objectives only if there is a design to avoid or minimize impacts to archaeological resources.

GENERAL POLICIES

- The Plan stipulates that Monterey County shall encourage timely identification of archaeological resources so that preservation of resources can be considered during the conceptual design phase of land use planning or project development.
- Whenever development occurs in the coastal zone, including excavation activity and vegetation removal for agricultural use, the Archaeological Site Survey Office or other appropriate authority shall be contacted to determine whether there has been an archaeological survey. If no survey has been completed, the parcel on which the proposed development will be placed shall be surveyed if located within 100 yards of various floodways specified in the Plan.

- Additionally, a survey shall be completed if the parcel is located within 100 yards of a known archaeological site. The archaeological survey should address the sensitivity of the site, appropriate levels of development, and mitigation consistent with the site's need for protection.
- All available measures shall be explored to avoid development on sensitive prehistoric or archaeological sites.
- When developments are proposed in areas where cultural resources have been identified, projects shall be designed to avoid impact. Emphasis shall be placed on preserving the entire site rather than on excavation, particularly where the site has religious significance.

SPECIFIC POLICIES

- No development in archaeologically sensitive areas or restricted under "General Policies" shall be categorically exempt from environmental review.
- If avoidance is not possible, mitigation shall be conducted in accordance with guidelines of the State Office of Historic Preservation and the State of California Native American Heritage Commission. Any adverse impact of development on cultural resources shall be mitigated to the maximum extent feasible. Off road vehicles, unauthorized collecting of artifacts, and other activities potentially damaging to cultural resources sites are prohibited.
- Access to known cultural resources sites shall be limited. Any access should be concentrated in areas with supervision or interpretive functions (Monterey County 1982b),

MONTEREY COUNTY COASTAL IMPLEMENTATION PLAN

The Monterey County Coastal Implementation Plan seeks to regulate development in the North County Land Use Plan Area. New projects shall be considered compatible with the intent of the plan only if they incorporate all site planning and design features necessary to avoid or mitigate impacts to archaeological resources.

ENVIRONMENTAL SETTING

REGIONAL DESCRIPTION

The project area is located in Elkhorn Valley, which was initially created by the drainage of Great Valley through what is now Santa Clara Valley into Monterey Bay. During the late Pleistocene (150,000 to 300,000 before present [B.P.]), the flow of these major rivers into the upper reaches of Elkhorn Valley was cut off by movement and uplift along the San Andreas Fault. Water that had flowed through Elkhorn Valley was now retained in the southern Santa Clara Valley to form Lake Benito. Pajaro River was formed by continued fault movement, and it drained into the lake. Increased precipitation and runoff during the glaciations of the late Pleistocene resulted in smaller temporary creeks in Elkhorn Valley. Stratigraphy in the western end of Elkhorn Slough indicates that between 16,000 and 10,000 years B.P., such a creek still existed in the Elkhorn Slough (Dietz et al. 1988, p. 8). At the

end of the Wisconsin glacial period, as sea level rose rapidly, marine water flooded the lower portions of Elkhorn Valley, and between 10,000 and 8,000 years B.P. formed a high energy tidal inlet. Subsequent infilling of the main slough channel eventually impaired direct connection with the ocean, and the energy of the depositional environment was greatly reduced, thus creating a quiet water estuary or coastal lagoon from approximately 5,000 years B.P. to A.D. 1946. Salinity in the slough is believed to have been relatively brackish between 5,000 and 2,000 years B.P. (Dietz et al. 1988, p. 8).

Moss Landing Power Plant is situated on the south bank of Elkhorn Slough, which today is the main branch of a system of tidal channels that enter the coastal plain of northern Monterey County at Moss Landing Harbor, and reach inland for approximately seven miles. A basin, formed by this channel system, is lined by alternating communities of salt marsh and mudflat, and is bordered to the east and northeast by rolling hills that extend into steeper terrain at the southern end of the Santa Cruz Mountains. Adjacent drainage systems are the Pajaro River to the north and the Salinas River to the south (Dietz et al. 1988, p. 7).

Prior to 1908, the Salinas River curved northward near the location of its present mouth and ran parallel to the coastline for approximately six miles, emptying into the ocean about one mile north of the present harbor mouth. Elkhorn Slough opened into the river near the present site of Moss Landing Harbor, creating a brackish estuarine environment. Occasionally, during severe winters, the Salinas River reportedly cut through sand dunes near its present mouth and emptied into the ocean there. Land movement caused by the 1906 earthquake created a more permanent ocean outlet at the same location, and flood control dam construction after 1908 made that outlet permanent (Dietz et al. 1988, p. 7).

With the former mouth of the Salinas River kept open by tidal action, and the cessation of freshwater flow into the Elkhorn Slough Basin, the brackish estuary was replaced by the saline estuary that is present today. The present day mouth of the slough is a man made channel that was constructed as the entrance to the Moss Landing Harbor in 1946. Since the construction of the harbor jetty, the old mouth of the Salinas River (north of Moss Landing) has gradually silted in and closed (Dietz et al. 1988, pp. 7-8).

PROJECT VICINITY DESCRIPTION

The proposed project is located within the existing MLPP, 12 miles northwest of Salinas, California in Monterey County near the Moss Landing Harbor, in an area that includes industrial facilities, agricultural lands, residences, recreational beaches and tidal wetlands. It is bordered on the west by Highway 1 and Moss Landing Harbor and on the south by Dolan Road. Elkhorn Slough is to the north, and Moro Cojo Slough is to the south. The current MLPP is situated on 239 acres.

Duke Energy has proposed a modernization plan designed to make MLPP a competitive energy facility. The Modernization Plan includes demolition of 19 tanks and eight 225 foot tall stacks. These actions are associated with ongoing operations at MLPP. They will be permitted by Monterey County and will be

consistent with the North County Land Use Plan (discussed in the LORS section of this document). The demolition of the fuel oil tanks will involve removal of tanks 1 through 19 and may require soil or ground water remediation (MLPP 1999a, pp. 2-9).

The proposed project will not require installation of new high voltage transmission lines. Instead, power from the combined-cycle units will tie into the existing PG&E 230 kV switchyard located immediately north of MLPP. Electrical connections will be constructed within the power plant to connect the new units to the switchyard. Existing offsite transmission lines connect MLPP to the regional and statewide electric grid. Existing roads will be used for site access.

The proposed project will improve the existing seawater intake structures for retired units 1 through 5. Traveling screens will be moved 350 feet to the west from their present location, to the intake area. The project will discharge cooling water through existing discharge structure for units 6 and 7. Modifications to the project and changes to intake and discharge structures will necessitate the installation of six 54 inch diameter discharge lines. An 84 inch diameter line will be installed connecting the new combined cycle units and the existing units 6 and 7 discharge system. If possible a portion of the existing 54 inch discharge lines will be reused in place (Duke Energy 1999e, p. 2).

For the most part existing natural gas pipelines and connections will be used. However, a new approximately 1,500 foot long, 14 inch diameter natural gas line will be installed between existing connections. The trench for the gas line will be about 20 inches wide and 5 feet deep. Trenching will be accomplished with a trencher or a backhoe. The laydown/staging area will be located next to tanks #3 and #4, and will be approximately 40,000 square feet. Additional information can be found in the Project Description section of this Preliminary Staff Analysis.

PREHISTORIC SETTING

There are eight recorded prehistoric sites within one kilometer of the MLPP project. Four of the sites, CA-MNT-229, CA-MNT-228, CA-MNT-234, and CA-MNT-1570, have been tested and are the major contributors to current knowledge pertaining to the prehistory of the area. Site CA-MNT-229 is situated within the APE, in the northwest corner. It is within Area 1, extends to the harbor, and is bisected by State Highway 1 (Duke Energy 1999b, pp. 4 and 6). All four sites exhibit a consistent pattern of occupation during the Millingstone/Archaic Period (older than the Early Period, but no clear time definition is available) and the Middle Period (2500-1000 B.P.), and perhaps during the Early Period (5000-2500 B.P.).

Each of the sites appears to contain a component between approximately 7,000 and 6,000 years B.P. during the Millingstone/Archaic Period. This component appears to represent use of the Moss Landing area by foragers with a high degree of residential mobility. Shellfish are the dominant material in this component, along with smaller quantities of stone tools, non-fish bone, and fish bone. Artifacts from this component at CA-MNT-229 include a fragmentary eccentric crescentic, long-

stemmed projectile points, and cobble tools. The slough environment was probably dominated by freshwater during this period (Duke Energy 1999b, pp. 6-7).

The Early Period is represented by several radiocarbon dates, and differences in shellfish, fish bone, non-fish bone, and artifacts from the previous period. One radiocarbon date, 3180+/-80 B.P., was available from CA-MNT-229. A deeply buried lithic workshop at CA-MNT-234 is also representative of this period. The slough environment was probably dominated by saltwater during this time (Duke Energy 1999b, p. 7).

The Middle Period is represented by numerous radiocarbon dates, numerous obsidian dates, and a variety of temporally sensitive artifacts. The Middle Period component appears to be the most extensive at several or all four of these sites. The slough environment was probably dominated by brackish water during this period (Duke Energy 1999b, pp. 7-8).

ETHNOGRAPHIC BACKGROUND

Ethnohistorically, Monterey County was inhabited by three different Indian groups, the Costanoan (or Ohlone), Esselen, and Salinan. Each group had its own language. The MLPP project area was inhabited by the Costanoan. Their territory extended from the Golden Gate area of San Francisco south to the vicinity of Point Sur. It extended inland as far as the Mt. Diablo Range in the north, as far as Soledad in the Salinas Valley, and approximately 10 to 15 miles up the Carmel Valley from the coast (Duke Energy 1999b, p. 8).

Within the Costanoan language group there were at least seven different dialects, most named after the mission that was established in the area. The MLPP project area was inhabited by the San Juan Bautista (Mutsen) speaking group. This group was in turn divided into an unknown number of "nations" as the Spanish called them. This refers to a tribelet, the largest politically cohesive land holding group. Each nation was further divided into smaller living groups known as rancherias by the Spanish. Many of the living groups and some of the villages were probably kin groups, containing 20 to 40 people. Archaeological evidence indicates that there were also villages whose population must have numbered in the hundreds (Duke Energy 1999b, p. 9).

HISTORIC SETTING

Prior to the arrival of European settlers, the Native Americans had occupied the land for hundreds of generations. They were seasonal hunter-gatherers, moving when either the climate or availability of flora and fauna necessitated relocation. In contrast to this way of life, the new settlers brought range cattle, railroads, and the quest for real estate (Urbas 1999, p. 3).

Moss Landing was originally settled by Paul Lezer. In 1860, Lezer purchased 300 acres of land at the mouth of the Salinas River from the State of California for one dollar per acre. Lezer planned to establish a settlement called the City of St. Paul, and installed a ferry across the Elkhorn Slough. The area became known as Moss Landing after a New England captain, Charles Moss, who recognized the potential

for the port to handle large quantities of grain for shipping. In 1866, he built a wharf and ran barges down the Salinas River to carry loads of grain being exported to the Pacific Steamship Company's service to San Francisco. Warehouses sprang up near the wharf and a settlement was formed (Fink in Urbas 1999, p. 4). The landing was also used as a whaling station until it was abandoned in 1888. The original Moss residence is listed on the California Listing of Historic Resources (1976) (Urbas 1999, p. 4).

Moss Landing was known for its canning plants, as well as its shipping access. Canneries have operated in this area since the late 19th century (Kandler and Rudo in Urbas 1999, p. 4). The earthquake of 1906, best known for devastating the San Francisco area, also destroyed most of the canneries in the Moss Landing area. The area was rebuilt from the rubble, and the canning industry reached its highest production levels during and immediately following World War II. Due to the overexploitation of the fishing resources in modern times, the fishing industry has suffered severe declines, with many of the original processing plants closing; however, several canneries still operate near the project area today (Kandler and Rudo in Urbas 1999, pp. 4-5).

In the late 1930s, PG&E bought land from Cato Vierra in preparation for construction of the MLPP. During the 1940s, within Monterey County, the area of Moss Landing was targeted for industrial development. Taxes, investment, and employment that were brought to the community by PG&E were an important part of county planning. Development of the steam plant known as MLPP began in 1948.

PRE-AFC LITERATURE AND RECORDS SEARCH

Prior to preparation of the AFC, the consultant to the applicant conducted a records search and literature review through the Northwest Information Center of the California Historical Resources Information System, located at Sonoma State University, Rohnert Park. A records search through the regional information center is required by state guidelines and professional standards. Upon completion of the project, a copy of the Cultural Resources Report must be filed with the appropriate information center.

The information center houses site, survey, and excavation information pertinent to the Area of Potential Effects (APE). This allows the researcher to determine what site types may be present within the boundaries of the APE and what their eligibility status is regarding the National Register of Historic Places (NRHP), the California Register of Historic Resources (CRHR) and/or any local register.

The archival review included an examination of archaeological site records, maps, and project reports and files. Additionally, files and maps at Archaeological Consulting (consultant's firm), were reviewed. Several archaeological reports were produced for PG&E and had not been filed with the Northwest Information Center. Contacts were established to obtain copies of these reports (Duke Energy 1999b, p. 3). All information obtained as a result of the records search provided the consultant with information necessary to evaluate the project's potential to affect cultural resources during construction and operation.

Results of the literature review and a brief description of the known resources are summarized in this document under the heading "Prehistoric Setting" and in the AFC, in Section 6.7. Site specific information was filed with the Energy Commission under confidential cover.

Prior to Duke Energy's interest in the MLPP, one survey and three excavations had taken place within the APE. In 1973, all of Area 7 was surveyed by Roberta Greenwood (Duke Energy 1999b, p.12) in conjunction with the development of the east tank farm. Survey results were negative. In 1979, Ann Peak conducted a test excavation at CA-MNT-229 in association with the installation of sewer pipe lines and pump stations. In 1984, Steven Dondero (Dondero et al. 1984) completed additional testing at site CA-MNT-229. This test excavation resulted in the site being recommended as eligible for the NRHP under criterion "d," the site's potential to provide information important to our understanding of the prehistory of the area. In 1985, Dietz et al. (1988) completed a data recovery program at CA-MNT-229. This data recovery was conducted prior to the widening of the Elkhorn Slough Bridge. Only portions of the site that were to be impacted by construction were excavated.

FIELD SURVEYS

On February 2 and 25, 1999, Archaeological Consulting archaeologist Mary Doane completed an on-site pedestrian survey of the accessible portions of the APE. Soil visibility in the northwest portion of Area 1 provided evidence of archaeological site CA-MNT-229. Area 2 was completely obscured by buildings. The portion of Area 3 east of Highway 1 was also completely obscured by buildings. Area 3 on the west side of Highway 1 provided some soil visibility. There was no evidence of archaeological material. Access onto portions of Areas 4, 5, 6, and 7 was limited due to standing water. The parts of these parcels that were examined showed no evidence of archaeological material (Duke Energy 1999b, p. 3).

On June 10, 1999, Archaeological Consulting archaeologist Mary Doane returned to MLPP to survey the areas that had been submerged during the February survey. She was able to survey all of Areas 4, 5, and 6. Other than a small area around the sump pump east of storage tank #7, she was able to survey all of Area 7. No evidence of cultural material was identified during this survey (Duke Energy 1999b, p. 3).

NATIVE AMERICAN CONTACTS

On March 9, 1999, Carolyn E. Trindle of TRC Environmental Solutions, Inc. (TRC) contacted the NAHC on behalf of Duke Energy to request a search of the Sacred Lands File and a list of Native Americans who are on file with the NAHC as contacts for the vicinity of Moss Landing. Two names were provided, Phillip Galvan and Andrew Galvan, father and son, respectively (TRC phone log April 9, 1999). Robert C. Mason, Vice President of Planning and Development for TRC, contacted Phillip Galvan and Andrew Galvan on March 24, 1999. He requested their responses to information pertaining to the Duke Energy proposed project for MLPP (TRC letter March 24, 1999). Between the dates of March 31 and April 21, 1999,

Ms. Trindle telephoned Andrew Galvan four times and Debbie Treadway of the NAHC twice. Ms. Trindle notified Andrew Galvan that a copy of the consultant's report was mailed to him on April 8, 1999. Andrew Galvan acknowledged receipt of the report (TRC phone logs March 31, April 7,9,15, and 19, 1999).

Andrew Galvan also contacted Ms. Treadway to review a file of information on a Sacred Site that had been filed by his father. Andrew Galvan was to review the information and plot the Sacred Site on a map of the MLPP. During a telephone conversation between Andrew Galvan and Ms. Treadway, Mr. Galvan stated that he was very busy with work but would get back to TRC. As of December 1, 1999, he had not contacted TRC regarding the location of the Sacred Site. The last telephone call with the NAHC regarding Andrew Galvan's concerns is recorded in the TRC phone log April 21, 1999 (Duke Energy 1999a, Appendix 6.7-2).

SUMMARY OF KNOWN CULTURAL RESOURCES WITHIN THE APE

The records search and field survey of the APE indicate that there is one NRHP eligible site within the APE. Site CA-MNT-229 is classified as a 2S1 site, which means it has been determined eligible for separate listing by the Keeper of the Record (Duke Energy 1999b, p. 5). Testing has occurred twice at this site (Peak 1979; Dondero et al. 1984). In 1985, data recovery was conducted in conjunction with the widening of the bridge over Elkhorn Slough (Dietz et. al. 1988). Excavation occurred only in the areas where construction related impacts to the site were expected.

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 influence the analysis of impacts to the resources and the measures that may be required to mitigate any such impacts.

Under federal law, only historic or prehistoric sites, objects or features, or architectural resources that are assessed by a qualified researcher as "significant" in accordance with federal guidelines typically need to be considered during the planning process. The significance of historic and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the NRHP as defined in 36 CFR Section 60.4. If such resources are determined to be significant, and therefore eligible for listing in the NRHP (or the CRHR), they are afforded certain protection under Section 106 and/or CEQA. The Advisory Council on Historic Preservation, for example, must be given an opportunity to comment on any federally funded or permitted undertaking that could adversely affect such resources.

The NRHP criteria state that "eligible historic properties" are: districts, sites, buildings, 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. The state has a similar set of criteria.

Under federal law, resources determined not to be significant, that is, not eligible for NRHP listing, are subject to recording and documentation only, and are afforded no further protection. However, occasionally certain resources, although they may not be assessed as “significant,” may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed significance. 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 records and literature search and the on-site pedestrian surveys of the proposed project APE were conducted to identify the presence of any cultural resources sites or materials. Where resources were identified, additional evaluation was conducted to determine whether the resources are already listed on, or are potentially eligible for listing on either the NRHP (36 CFR 800) or the CRHR.

The State Resources Agency has 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, Code of California Regulations Sections 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 “historic 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 “historic 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 that historic resource,” which the regulations define as a significant effect on the environment. CEQA changes also indicate that the mitigation for impacts to historic resources that meet these criteria shall not be subject to the limitations provided in PRC Section 21083.2.

Test excavations (discussed in the Pre-AFC Literature and Records Search section of this document) completed in 1984, resulted in the site being recommended for eligibility to the NRHP. The NRHP determined the site to be significant and eligible for listing under criterion “d.” Using the above criteria, staff concurs that the NRHP eligible cultural resources site, CA-MNT-229, described in the AFC and in subsequent filings for the MLPP project, is an historic resource.

Finally, CEQA contains a statute addressing “unique” archeological resources. It establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique (PRC Section 21083.2). The statute also provides a definition of unique archeological resources. The CEQA Guidelines do, however, state that this prohibition does not apply when an archeological resource has already met the definition of a historic resource (California Code of Regulations Section 15064.5). Since staff has determined that the site for which it is recommending mitigation does meet the definition of historical resource, the prohibition does not apply to the mitigation discussed in this Staff Assessment.

IMPACTS

Since project development and construction usually entail surface and subsurface disturbance of the ground, the proposed MLPP project has the potential to adversely affect a known cultural resources, prehistoric site CA-MNT-229 and previously unknown cultural resources.

PROJECT SPECIFIC IMPACTS

Project related impacts may be categorized in several, interrelated ways. Impacts to the cultural resources may either be temporary or permanent impacts that could be associated with site preparation, project construction, project operation, and/or project closure. Project related impacts may also result either directly or indirectly during the preconstruction, construction, operation, and/or closure of the project. A project may also have an impact that must be considered as part of an overall, cumulative perspective. At the MLPP project, earth disturbance activities could impact previously undiscovered resources, as well as recorded site CA-MNT-229.

Often the potential for project related construction activities to impact previously unknown cultural resources cannot be fully evaluated until the subsurface soils are exposed by grading, excavation, trenching, and/or augering. However, a determination of the potential for discovery of cultural resources can be made based on the results of the literature review and the field surveys. The presence of prehistoric site CA-MNT-229 within the APE, the number of recorded prehistoric sites in the vicinity of the APE, and the evidence for human habitation over a period of thousands of years, indicate that construction of the proposed project has the potential to encounter previously known and unknown cultural resources.

Recently, Native Americans have expressed concern regarding earth disturbance in relation to several projects either before the Energy Commission or anticipated in the near future. These projects are Three Mountain, Metcalf, Elk Hills and Moro Bay.

Native Americans are particularly concerned about the treatment during construction of Native American graves and artifacts; natural resources used for food, ceremonies, or traditional crafts; and places that have special significance because of spiritual power associated with them.

The role of a Native American monitor involves working with and acting as a liaison between Native Americans, archaeologists, developers, and concerned agencies. A Native American monitor should also share information so that others at the project site will understand the importance of the resources to the Native American community. An onsite Native American monitor will also ensure that cultural resources are treated appropriately from the Native American point of view. Treating Native American concerns regarding cultural resources with sensitivity is a way to minimize project related litigation.

POTENTIAL FOR “ADVERSE CHANGES” TO HISTORIC RESOURCES

Based on NEPA, the Warren-Alquist Act, and the Energy Commission Siting Regulations, the Energy Commission staff must evaluate the potential for significant impacts to cultural resources. Based on CEQA, the Energy Commission staff must evaluate the “potential for adverse changes in the significance of historic resources.” The AFC indicates that prehistoric site CA-MNT-229 is within the APE and seven other prehistoric sites are within one kilometer of the APE, suggesting that there may be additional previously unrecorded sites within the boundaries of the APE.

The traveling screens will be relocated to the western edge of CA-MNT-229, where the intake structure for units 1 through 5 is now situated. This area was previously disturbed during the installation of the intake structure. Installation of the traveling screens should not affect CA-MNT-229 because the intake structure is already in place, and the machinery required for the installation will be confined to areas presently covered with asphalt. The machinery used for modification and construction of the traveling screens and intake structures will be typical construction equipment such as backhoes, excavators, front-end loaders and cranes (Duke Energy 1999c, p. 2). However, according to Scott Flake of Duke Energy, only a small crane will be used in this area of the relocation (Flake 1999a, personal communication). Staff is concerned about this very sensitive site and has included conditions that stipulate cultural resources monitoring in this area.

Generating units 1 through 5 will be replaced with two 530 MW high efficiency combined-cycle units. Units 6 and 7 will be upgraded by 15 MW each. These tasks should not affect any cultural resources because no ground will be disturbed during these efforts.

Eight 225 foot tall stacks that were previously used for the retired units 1 through 5 will be dismantled. This task will involve ground disturbance, and therefore, potential effects to as yet unrecorded cultural resources.

CUMULATIVE IMPACTS

According to CEQA Guidelines, cumulative impacts are associated with the construction and operation of other projects occurring in the same area or region or occurring in the same general time frame. For cultural resources, cumulative impacts 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.

In addition to the MLPP project, Duke Energy has two other planned activities: demolition of onsite fuel storage tanks, and the Selective Catalytic Reduction (SCR) installation for units 6 and 7. Portions of these modernization activities may occur concurrently with the MLPP project. Like the project, these other modernization activities will be performed entirely within the confines of the existing industrial power plant property.

Tank demolition and removal will be permitted by the County of Monterey. The cultural section of the AFC, page 6.7-8, recommends cultural resources monitoring during removal, preconstruction and construction activities in the area of tanks #3, #4, and #10. The AFC also recommends cultural resources monitoring during any activity that disturbs the soil under tank #10. Staff discussed these concerns with Monterey County and was assured by Planner Bud Carney that a condition would be written in Monterey County's permit to address these areas identified by the applicant. Therefore, no unmitigatable cumulative impacts to cultural resources will occur as a result of the tank demolition, SCR installation, and the MLPP project. There are several offsite land development projects in the vicinity of MLPP (Duke Energy 1999a, p. 6.7-8). Although it appears that any potential impacts from the preconstruction or construction activities at MLPP will be confined within project boundaries, due to the numerous cultural resource sites in the vicinity of the project, there is a potential for cumulative impacts to cultural resources.

PLANNED PERMANENT CLOSURE

A planned permanent closure occurs when the facility is closed in a planned, orderly manner, such as at the end of its useful economic or mechanical life or due to unfavorable economic conditions. In general, decommissioning activities for the facility will attempt to maximize the recycling of all facility components. The site will be secured 24 hours per day during the decommissioning activities (Duke Energy 1999a, pp. 4-1, 4-3, and 4-4).

Planned permanent closure may impact cultural resources, particularly CA-MNT-229, a NRHP eligible site. The exposed portions of the site should be fenced prior to decommissioning activities, and remain fenced until all decommissioning activities are complete. Activity planned for the area, following the closure, will determine whether the fencing remains in place or is removed.

At the time of closure, all then applicable LORS will be identified and the Energy Commission required closure plan will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are more likely to depend upon the location of project structures in relation to existing resources, and then upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structure 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.

FACILITY CLOSURE

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the owner unexpectedly closes the facility permanently or suddenly while the owner is implementing an outside contingency plan or when the project owner has abandoned the project. In the event of an unexpected permanent facility closure, Duke Energy will follow the procedures outlined in the onsite contingency plan to assure that the appropriate steps to mitigate public health and safety and environmental concerns are taken in a timely manner. The Energy Commission's compliance unit and other responsible agencies will be notified. The Energy Commission will be informed of the status of closure activities (Duke Energy 1999a, pp. 4-1 and 4-4).

Unexpected permanent closure may impact cultural resources, particularly CA-MNT-229, a NRHP eligible site. The exposed portions of the site should be fenced prior to decommissioning activities, and remain fenced until the all decommissioning activities are complete. Activity planned for the area following the closure, will determine whether the fencing remains in place or is removed.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly and on a short-term basis, due to unplanned circumstances such as a natural disaster, economic conditions, or other unexpected event or emergency. For short term unexpected closure that does not involve facility damage resulting in hazardous substance release, the facility would be kept "as is" and ready for restart when the unexpected closure event is rectified or ceases to restrict operations. If there is a possibility of hazardous substances release, the Energy Commission's compliance unit will be notified, and procedures will be followed as set forth in the MLPP project Risk Management Plan (Duke Energy 1999a, pp. 4-1, 4-2)

Unexpected temporary closure would not directly affect cultural resources. However, while the facility is non-operational and personnel numbers have been reduced, there is the possibility of vandalism on the premises. To prevent vandalism to CA-MNT-229, a NRHP eligible site, the exposed portions of the prehistoric site should be fenced

MITIGATION

The AFC indicates that prehistoric site CA-MNT-229 is within the APE. In addition, there are seven other prehistoric sites in the vicinity of the MLPP (Duke Energy 1999a, p. 6.7-5). The presence of CA-MNT-229 within the APE, the preponderance of prehistoric sites in the vicinity of the APE, and the fact that the MLPP was not surveyed for archaeological remains prior to its construction in the late 1940s, indicate that there may be additional previously unrecorded archaeological sites within the boundaries of the MLPP. Since project implementation will involve ground disturbance in several areas, there is potential for the project to impact as yet unknown archaeological resources.

The preferred mitigation for impacts to cultural resources is avoidance of the resource. If previously unknown cultural resources are encountered during project related ground disturbance activities, and they cannot be avoided, then contingency measures must be in place to protect these resources. Critical to the success of any mitigation effort is the selection of a qualified professional cultural resources specialist. This designated specialist must have the authority to halt or redirect work if cultural resources are encountered. Commission staff must review the qualifications and approve of the professional archaeologist designated by the project owner to lead and participate in project monitoring and mitigation efforts.

Mitigation measures are developed to reduce the potential for adverse impacts to cultural resources within the APE to a less than significant level. Staff has recommended a series of conditions of certification that would help ensure the mitigation of project impacts. The proposed conditions are presented in the approximate sequence in which they would be implemented and include specific time requirements to reflect a phased or staged sequence implementation prior to, during, and following project construction.

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 guidelines, and Energy Commission staff recommendations. All of these mitigation measures have previously proven successful in protecting sensitive cultural resources from construction related impacts, while allowing the timely completion of many projects throughout California.

APPLICANT'S PROPOSED MITIGATION

As indicated in the AFC and in the confidential filings, prehistoric site CA-MNT-229, a NRHP eligible site, is located within the APE, in the northwest portion of Area 1. Project plans for that area do not involve any ground disturbance activities, so direct impacts to the site are not expected. Further, equipment that will be used to install the new traveling screens will be accommodated by existing asphalt capped areas. There should be no need for any vehicular or pedestrian traffic to come in contact with exposed areas of the site. However, to ensure that CA-MNT-229 is not accidentally impacted, all exposed portions of the site should be fenced prior to project related activities of any sort.

In Section 6.7.3 of the AFC, the applicant presents the statement, "Based on the above analysis of impacts [that are detailed in Section 6.7.2.4 Project Design Features] and the design features that have been incorporated into the Project, no mitigation measures are required" (Duke Energy 1999a, p 6.7-9). The AFC does provide measures, however, in the event previously unrecorded cultural resources are encountered during construction. These proposed measures are to be incorporated into the Cultural resources Monitoring and Mitigation Plan to be prepared, as described in the proposed conditions of certification. The measures are as follows:

- An archaeological monitor shall be present during construction or preconstruction activities that involve moving the soils of the berms around Fuel Tanks 3, 4 and 10 or the soils beneath the enclosure of Fuel Tank 10.
- An archaeological monitor shall be present during construction activities in the northwest corner of MLPP that have the potential to cause incidental impacts to areas in the vicinity of CA-MNT-229. If human remains or intact cultural features are discovered in context during these activities, work shall be halted within the immediate area of the find until it can be evaluated by the monitor, and appropriate mitigation measures are formulated and implemented.
- Prior to the start of construction activities for the units 1 through 5 intake structure and associated piping, the construction crew shall be informed of the general location of site CA-MNT-229, and shall be directed to avoid encroaching on the site with heavy equipment, foot or vehicular traffic, construction materials, and demolition stockpiles. Appropriate protection (i.e., fencing) shall be provided for this site during construction.
- The following standard language or an equivalent, shall be included in any permits issued within the project area: "If archaeological resources or human remains are discovered during construction, work shall be halted within the immediate area of the find until it can be evaluated by a qualified professional archaeologist. If the find is determined to be significant, appropriate mitigation measures shall be formulated and implemented."
- The AFC concludes that implementation of the Project design features noted above will assure that known cultural resources are avoided. They will also provide for identification and, if warranted, recovery and treatment of unknown cultural resources discovered during construction. As a result, no significant unavoidable adverse impacts to cultural resources are expected (Duke Energy 1999a, pp. 6.7-8 and 6.7-9).

In addition to the mitigation measures outlined in the AFC, the archaeological consultant to the applicant made further specific recommendations that follow (Duke Energy 1999b, pp. 12-14):

- No construction related activities with any potential for subsurface impacts should be planned within the National Register eligible archaeological site, CA-MNT-229. Section 106 requirements for testing and mitigation would be necessitated by any planned impacts to this site.
- An archaeological monitor should be present during construction and preconstruction activities that involve moving the soils of the berms in Areas 4 and 5 or the soils beneath the enclosure of tank #10. An archaeological monitor should also be present during construction activities in Area 1 which have the potential to cause incidental impacts to the cultural soils of CA-MNT-229. If human remains or intact cultural features are discovered during these activities, work shall be halted within 50 meters (150 feet) of the find until it can be evaluated by the monitor, and appropriate mitigation measures formulated and implemented. Artifactual materials discovered in a previously disturbed context will be recovered for appropriate analysis and curation.

If a portion of the existing 54 inch discharge lines can be used in place, the extent of excavation to cut these lines and connect the new 84 inch cooling water main would be approximately 40 feet by 100 feet by 12 feet deep, beginning at a point about 130 feet east of the existing pumpwell and extending further east. If the existing piping is not reused, the excavated area for the new pump discharge lines and tie-ins to the new 84 inch main would affect an area of about 40 feet by 100 feet by 12 feet deep, beginning immediately east of the pumpwell structure and extending to the east.

Two excavated trenches, approximately 20 feet to 60 feet wide (depending on construction technique) by 12 feet deep, will be required to install the new 84 inch cooling water supply and return lines. One trench, which will contain the 84 inch supply line, will extend from the location of the tie-ins with the 54 inch pump discharge lines to the new units. The second trench, for the two new return lines, will extend from the point where the return line goes underground to the existing units 6 and 7 discharge system.

For the above mentioned trenches, excavation that takes place within previously undisturbed sediments should be monitored by a qualified archaeologist. Excavation within areas of fill does not need to be monitored. If it cannot be determined whether excavation is within fill or previously undisturbed sediments, then a qualified archaeological monitor should be present.

A new approximately 1500 feet long and 14 inch diameter natural gas line will be installed between existing connections. The trench for the gas line will be about 20 inches wide and 5 feet deep. Trenching will be accomplished with a trencher or a backhoe, the latter often being used to lower pipe into the trench. The lay down/staging areas will be located next to tanks #3 and #4, and will be approximately 40,000 square feet. A qualified archaeological monitor should be present during excavation for the new gas line.

STAFF'S PROPOSED MITIGATION MEASURES

Energy Commission staff concurs with the mitigation measures proposed by the applicant and the archaeological consultant in the AFC and in supplemental filings. 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 the region's cultural resources.

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, and staff's recommendations. The mitigation measures set forth in the conditions have been applied to previous projects where resources were subject to construction related impacts, allowing the timely completion of many projects throughout California.

If any previously unspecified ground disturbance activities, such as trenching, should occur, a qualified archaeological monitor should be present. If intact cultural features are discovered during these activities, work shall be halted within 50 meters (150 feet) of the find until it can be evaluated by the monitor, and appropriate mitigation measures formulated and implemented. Artifactual materials discovered in a previously disturbed or undisturbed context will be recovered for appropriate analysis and curation.

Staff recommends that any as yet unknown sites that may still retain integrity and for which significance has not been formally assessed, will, until a determination of significance can be made, be presumed to be significant and potentially eligible for listing on the NRHP per 36 CFR 60.4(d).

Moss Landing is located in an area of high archaeological sensitivity. The original Moss Landing Power Plant was built, in part, on an archaeological site that is now listed on the NRHP. The AFC states that workers have continued to find resources in berms around some of the tanks (Duke Energy 1999b, p. 11). Human remains were discovered during excavation of a portion of the site that is outside the boundaries of MLPP.

Staff recommends requiring the participation of a Native American monitor as part of the cultural resources team as a proactive measure. There is potential for discovering human remains at MLPP and it is sensible to have a Native American on site so that there is no question concerning the treatment of remains or artifacts, if they are unearthed by construction personnel.

MITIGATION OF INDIRECT IMPACTS

According to CEQA Guidelines, indirect impacts are caused by the project, but they may occur at a later time or a different place. For cultural resources, indirect impacts may result from increased erosion due to site clearance and preparation or the destabilization of slopes. Impacts may also occur if heavy equipment, foot or vehicular traffic, construction materials, or stockpiles are allowed to encroach onto the site. Project related improvements in areas with access to sensitive resources may lead to inadvertent damage or outright vandalism to exposed resource materials. However, if site avoidance, fencing, and worker education are conducted according to the conditions of certification, impacts should not occur.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

There is one site, CA-MNT-229 within the project APE that has been determined eligible for the NRHP. There is a total of eight recorded prehistoric cultural resources sites within the project vicinity. Because LORS requiring archaeological surveys were not in place prior to the construction of the MLPP, it is possible that previously unrecorded prehistoric archaeological sites may be within the boundaries of the MLPP, and specifically the APE. These potentially present sites have not been evaluated for eligibility to the NRHP. Therefore, to minimize potential impacts

to 1) a cultural resource that has been determined eligible for the NRHP (CA-MNT-229) and 2) potentially present sites that have not yet been evaluated for eligibility to the NRHP, the following shall apply:

Under CEQA, the Energy Commission is required to make findings as to the presence of historic resources in the area potentially affected by a project and to draw conclusions as to the potential significance of the resources and/or the impacts. Staff has determined that the known resource site described in the AFC and in the confidential technical reports meets one or more of the criteria needed to identify it as an "historic resource." Staff has reviewed the discussions of the materials recorded at the known site found within the APE. Staff has reviewed the recommendations of the applicant's archaeological specialist and has incorporated them into the proposed conditions of certification.

Staff has incorporated the various cultural resources mitigation measures into a proposed set of conditions of certification for the MLPP project. The cultural resources conditions of certification are presented as a means of anticipating potential impacts directly associated with the MLPP and they are expected to reduce any potential for adverse impacts to historic resources to a less than significant level.

The proposed conditions of certification are set forth below as a series of steps or activities that are intended to be completed in a phased sequence during project related pre-construction, construction, post-construction, and operation activities.

Staff believes that construction of the MLPP project can be accomplished in a manner that can avoid potential adverse changes to the significance of the known historic resource. The potential for adverse changes to as yet undiscovered additional historic resources will remain unknown until, and unless, such resources are encountered. Staff concludes that, if the proposed conditions of certification are implemented by qualified professionals in a timely and proper manner, the project will be in compliance with the applicable LORS.

RECOMMENDATIONS

Staff recommends that the Energy Commission make the appropriate finding regarding site CA-MNT-229, and adopt the following proposed conditions of certification, to ensure mitigation of potential impacts to sensitive cultural resources during the earth disturbing activities and construction of the MLPP project.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of project related earth disturbing activities, vegetation clearance, ground disturbance and preparation, site excavation activities, the project owner shall provide the Energy Commission Compliance Project Manager (CPM) with the name and statement of qualifications for its designated cultural resources specialist who will be responsible for implementation of all cultural resources conditions of certification.

The statement of qualification for the designated cultural resources specialist shall include all information needed to demonstrate that the specialist meets the minimum qualifications listed as follows:

1. a graduate degree in anthropology, archaeology, California history, cultural resources management, or a comparable field;
2. at least three years of archaeological resource mitigation and field experience in California; and
3. at least one year experience in each of the following areas:
 - a. leading archaeological resource field surveys;
 - b. leading site and artifact mapping, recording, and recovery operations;
 - c. marshaling and use of equipment necessary for cultural resources recovery and testing;
 - d. preparing recovered materials for analysis and identification;
 - e. determining the need for appropriate sampling and/or testing in the field and in the lab;
 - f. directing the analyses of mapped materials; and recovered artifacts;
 - g. completing the identification and inventory of recovered cultural resources material; and
 - h. preparing appropriate reports to be filed with the receiving curation repository, the SHPO, and the appropriate regional archaeological information center.

The statement of qualifications for the designated cultural resources specialist shall include:

4. a list of specific projects on which the specialist has previously worked;
5. the role and responsibilities of the specialist for each project listed; and
6. the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

Verification: At least ninety (90) days prior to the start of earth disturbing activities, the project owner shall submit the name and statement of qualifications of its designated cultural resources specialist to the CPM for review and written approval.

At least ten (10) days but no more than thirty (30) days prior to the start of earth disturbing activities, the project owner shall confirm in writing to the CPM that the approved designated cultural resources specialist 1) will be available at the start of earth disturbing activities and 2) is prepared to implement the cultural resources conditions of certification.

At least ten (10) days prior to the termination or release of a designated cultural resources specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and résumé of the proposed new designated cultural resources specialist.

CUL-2 Prior to the start of earth disturbing activities, the project owner shall provide the designated cultural resources specialist and the CPM with maps and drawings issued for the construction site plan and site layout and for the final alignment of any linear facilities. Maps provided will include the USGS *Moss Landing* 7.5 minute topographic quadrangle map and a map at an appropriate scale (i.e., 1:2000 or 1" = 200') for plotting individual artifacts. Maps shall show the following:

The location of all areas where surface disturbance may be associated with project related access roads, and any other project components.

Verification: At least seventy-five (75) days prior to the start of earth disturbing activities on the project, the project owner shall provide the designated cultural resources specialist and the CPM with final drawings and site layouts for all project facilities and for all areas potentially affected by project earth disturbing activities or project construction, on the USGS *Moss Landing* 7.5 minute topographic quadrangle map and on a map at a scale of 1:2000 or 1" = 200. If the designated cultural resources specialist requests enlargements or strip maps for linear facility routes, the project owner shall provide them.

CUL- 3 Prior to the start of any earth disturbing activities, the designated cultural resources specialist 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.

Protocol: The CRMMP shall include, but not be limited to, the following elements and measures.

1. A proposed research design that includes a discussion of questions that may be answered by: mapping, data and artifact recovery conducted during monitoring and mitigation activities, and post-construction analysis of recovered data and materials.
2. A discussion of the implementation sequence and the estimated time frames needed to accomplish all project related tasks during the preconstruction, construction, and post-construction analysis phases of the project.
3. 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.
4. A discussion of the need for Native American observers or monitors, the procedures to be used to select them, the areas or post mile sections where they will be needed, and their role and responsibilities.
5. A discussion of measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of

construction and how long they will be needed to protect the resources from project related effects.

6. A discussion of where monitoring of project construction activities is deemed necessary by the designated cultural resources specialist. 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.
7. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum that meets the standards and requirements for the curation of cultural resources set forth in Title 36 of CFR Part 79.
8. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovery of any cultural resources materials encountered during construction.
9. Identification of the public institution that has agreed to receive any data and artifacts recovered during project related monitoring and mitigation work. Discussion of any requirements, specifications, or funding needed for the materials to be delivered for curation and how they will be met. Also include the name and phone number of the contact person at the institution.

Verification: At least sixty (60) days prior to the start of earth disturbing activities, the project owner shall provide the Cultural Resources Monitoring and Mitigation Plan, prepared by the designated cultural resources specialist, to the CPM for review and written approval.

CUL-4 Prior to the start of any earth disturbing activities, the designated cultural resources specialist shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and written approval.

Protocol: The training program 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 designated cultural resources specialist or qualified individual(s) approved by the CPM and may be combined with other training programs prepared for biological resources, paleontological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least sixty (60) days prior to the start of earth disturbing activities on the project, 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 the workers are to follow if previously unknown cultural resources are encountered during construction. The project owner shall provide the name and résumé of the individual(s) performing the training.

CUL-5 Prior to the start of earth disturbing activities and throughout project construction, as needed for all new employees, the project owner shall ensure that the designated cultural resources 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 1) the CPM approved set of procedures for reporting any cultural resources that may be discovered during project related ground disturbance, and 2) the work curtailment procedures that the workers are to follow, in the event previously unknown cultural resources are encountered during construction.

Verification: Within seven (7) days after the start of earth disturbing activities, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided the CPM approved cultural resources training, and the set of reporting and work curtailment procedures, to all project managers, construction supervisors, and workers hired before the start of earth disturbing activities.

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 construction 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.

CUL-6 The designated cultural resources specialist or the specialist's delegated monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resources sites or materials are encountered during project related grading, augering, excavation and/or trenching.

If such resources are found and the specialist determines that they are not significant, the specialist may allow construction to resume. The project owner shall notify the CPM of the find as set forth in the Verification. If such resources are found and the specialist determines that they are or may be significant, the halting or redirection of construction shall remain in effect until:

1. The designated cultural resources specialist has notified the CPM of the find and the work stoppage;
2. The specialist, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
3. Any necessary data recovery and mitigation has been completed.

The designated cultural resources specialist, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the designated cultural resources 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: Thirty (30) days prior to the start of earth disturbing activities, the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist and delegated monitor(s) has/have the authority to halt construction activities in the vicinity of a cultural resources find.

For any cultural resources encountered that the specialist determines is or may be significant, the project owner shall notify the CPM as soon as possible.

For any cultural resources encountered that the specialist determines is not significant, the project owner shall include information regarding this determination in the next Monthly Compliance Report.

CUL-7 Prior to the start of earth disturbing activities and each week throughout the period involving any ground disturbing activities, including landscaping, the project owner shall provide the designated cultural resources specialist 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 designated cultural resources specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Verification: Ten (10) days prior to the start of earth disturbing activities and in each MCR thereafter, the project owner shall provide the CPM with a copy of the weekly schedule of the construction activities, as well as maps, showing where construction activity was to take place. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

CUL-8 Throughout earth disturbance, reconnaissance surveys and the construction monitoring and mitigation phases of the project, the designated cultural resources specialist and delegated 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 where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found. Locations shall be keyed into both the USGS *Moss Landing* 7.5 minute topographic quadrangle map and the larger scale (1:2000 or 1"=200') map.

The designated specialist shall prepare a weekly summary of the daily logs on the progress or status of cultural resources related activities. The designated resource

specialist and delegated monitor(s) may informally discuss the cultural resources 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 designated cultural resources specialist and delegated monitor(s) are included in the Monthly Compliance Report to the CPM.

CUL-9 The designated cultural resources specialist or delegated monitor(s) shall be present at times the specialist deems appropriate to monitor construction related grading, excavation, trenching, and/or augering in the vicinity of previously recorded archaeological sites and in areas where ground disturbance is taking place.

In addition to areas identified by the cultural resources specialist, monitoring shall take place in the following locations:

1. The area of the intake structure, located on the east side of Moss Landing Harbor, is now separated from adjacent areas to the north and south by a chain link fence. If there is any reason to extend project activities (whether or not earth is disturbed) to the other side of the fence, monitoring shall be required.
2. Installation of both 54 inch and 84 inch new pipes, that are connections to existing seawater intake pipes, is planned. Monitoring shall be required where the depth of the trench exceeds the depth of previous earth disturbance.
3. Monitoring shall be required during earth disturbance related to the installation of the new natural gas line.

Protocol: Except in the areas where monitoring is required by these conditions, if the designated cultural resources specialist determines that full time monitoring is not necessary in certain portions of the project area, the designated specialist shall notify the project owner of the changes. Evidence of monitoring activities shall be recorded in the daily log and provided in the monthly compliance report. The designated cultural resources specialist shall also record in the daily log the areas where monitoring is being reduced or is no longer deemed necessary.

Verification: Throughout project construction, the project owner shall include in the Monthly Compliance Reports to the CPM, copies of the weekly summary reports prepared by the designated cultural resources specialist, regarding project related cultural resources monitoring.

Cul-10 The project owner, through the designated cultural resource specialist, shall employ a qualified Native American monitor or monitors to observe project related ground disturbing activities.

Protocol: Prior to project-related earth disturbing activities, the project owner and the designated cultural resource specialist shall identify Native American monitor(s) with direct and specific knowledge and traditional Native

American ties to the Moss Landing Area. The project owner and cultural resource specialist shall develop an agreement(s) for a qualified Native American monitor or monitors [as suggested in guidelines provided by the Native American Heritage Commission (NAHC)]. The Native American monitor(s) shall report to the designated cultural resources specialist and shall be regarded as a member of the cultural resource monitoring team. The Native American monitor(s) shall be present during any project-related earth disturbing activities.

Verification: At least sixty (60) days prior to earth disturbing activities, 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 a qualified Native American monitor(s) prove unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

CUL-11 The project owner shall ensure that the designated cultural resources specialist performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resources materials encountered and collected during preconstruction 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 facility that will ensure the necessary recovery, preparation for analysis, and analysis of cultural resources materials collected during data recovery and mitigation for the project. 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 resources sites shall be kept confidential and accessible only to qualified cultural resources specialists.

CUL-12 Following completion of data recovery and site mitigation work, the project owner shall ensure that the designated cultural resources specialist prepares a proposed scope of work for the Cultural Resources Report. The project owner shall submit the proposed scope of work to the CPM for review and written approval.

Protocol: The proposed scope of work shall include (but not be limited to):

1. A discussion of any analysis to be conducted on recovered cultural resources materials;
2. A discussion of possible results and findings;
3. Proposed research questions that may be answered or raised by analysis of the data recovered from the project; and
4. An estimate of the time needed to complete the analysis of recovered cultural resources materials and prepare the Cultural Resources Report.

The project owner shall ensure that the Cultural Resources Report that is prepared by the designated cultural resources specialist at the conclusion of the project, follows the format provided by the California Office of Historic Preservation.

Verification: The proposed scope of work shall be completed within ninety (90) days following completion of the data recovery and site mitigation work. Within seven (7) 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 If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The County Coroner must be notified of the find immediately.

Verification: In the event human remains (or any bone material that cannot be positively identified as non-human by the monitor) are found, the monitor and the cultural resources specialist shall immediately notify the project owner and assist in following proper protocol, as prescribed by law. The CPM shall be notified of the find within 72 hours.

Cul-14 The project owner shall ensure that the designated cultural resources specialist prepares a Cultural Resources Report. The project owner shall submit the report to the CPM for review and written approval.

Protocol: The Cultural Resources Report shall include (but not be limited to) the following:

1. For all projects:
 - a. A description of pre-project literature search, surveys, and any testing activities;
 - b. Maps showing areas surveyed or tested;
 - c. A description of any monitoring activities;
 - d. Maps of any areas monitored; and
 - e. Conclusions and recommendations.
2. For projects in which cultural resources were encountered, include the items specified above and also provide:
 - f. site and isolate records and maps;
 - g. a description of testing for, and determinations of, significance and potential eligibility; and
 - h. a discussion of the research questions answered or raised by the data from the project.
3. For projects regarding which cultural resources were recovered, include the items specified above and also provide:
 - i. A description of pre-project literature search, surveys, and any testing activities;
 - j. Results and findings of any special analyses conducted on recovered cultural resources materials;

- k. An inventory list of recovered cultural resources materials; and
- l. The name and location of the public repository receiving the recovered cultural resources for curation.

Verification: The project owner shall ensure that the designated cultural resources specialist completes the Cultural Resources Report within ninety (90) days following completion of cultural resources activities on behalf of the project or the analysis of the recovered cultural materials. Within seven (7) days after completion of the report, the project owner shall submit the Cultural Resources Report to the CPM for review and written approval.

CUL-15 The project owner shall submit an original, an original quality copy, or a computer disc copy of the CPM approved Cultural Resources Report to the public repository that will receive the recovered data and materials for curation, to the SHPO, and to 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 Cultural Resources Report to be sent to the curating repository, the SHPO, and the regional information center shall include the following (based on the applicable scenario set forth in CUL-14):

1. Original quality copies of all text;
2. Originals of any topographic maps showing site and resource locations;
3. Originals or original quality copies of drawings of significant or diagnostic cultural resources materials found during preconstruction surveys or during project related monitoring, data recovery, or mitigation; and
4. Photographs of the site(s) and the various cultural resources materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curating repository with a set of negatives for all of the photographs.

Verification: Within thirty (30) days after receiving approval of the Cultural Resources Report, 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 Cultural Resources Report with the public repository receiving the recovered data and materials for curation, the SHPO, and the appropriate archaeological information center.

CUL-16 Following the filing of the CPM approved Cultural Resources Report with the appropriate entities, the project owner shall ensure that all cultural

resources materials, maps, and data collected during data recovery and mitigation for the project, are delivered to a public repository that meets the U.S. Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay the curation fee required by the repository.

Verification: For the life of the project, the project owner shall maintain in its project history or compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resources materials collected during data recovery and mitigation for the project.

ACRONYMS

AFC: Application for Certification
APE: Area of Potential Effects
B.P.: Before Present (1950)
CEQA: California Environmental Quality Act
CFR: Code of Federal Regulations
CPM: Compliance Project Manager
CRHR: California Register of historic Resources
CRMMP: Cultural Monitoring and Mitigation Plan
DPR: Department of Parks and Recreation
Duke Energy: Duke Energy Power Services
EIR: Environmental Impact Report
Energy Commission: California Energy Commission
LORS: Laws, Ordinances, Regulations and Standards
MCR: Monthly Compliance Report
MLPP: Moss Landing Power Plant
NAHC: Native American Heritage Commission
NEPA: National Environmental Policy Act
NRHP: National Register of Historic Places
Plan: North County Land Use Plan
PG&E: Pacific Gas & Electric Company
PRC: Public Resources Code
Section 106: Section 106 of the National Historic Preservation Act
SCR: Selective Catalytic Reduction
TRC: TRC Environmental Solutions, Inc.

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SOCIOECONOMIC RESOURCES

Testimony of Amanda Stennick

INTRODUCTION

Socioeconomic Resources encompasses several related areas of interest and concern. A typical socioeconomic impact analysis evaluates the effects of project-related population changes on local schools, medical and protective services, public utilities and other public services, the fiscal and physical capability of local governmental agencies to meet the needs of project-related changes in population, and the issue of environmental justice. This analysis discusses the potential effects of the proposed Moss Landing Power Plant Project (MLPPP) on local communities, community resources, and public services, pursuant to Title 14 California Code of Regulations, Section 15131.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

CALIFORNIA GOVERNMENT CODE, SECTION 65995-65997

Senate Bill 50 and other statutory amendments enacted in 1998 provide that, notwithstanding any other provisions of local or state law (including CEQA), state and local agencies may not require mitigation for the development of real property for effects on school enrollment except as provided by new provisions in the Government Code. (Govt. Code, Sec. 65996(a).) The relevant provisions restrict fees for the development of commercial and industrial space to the \$0.31 per square foot of "chargeable covered and enclosed space." (Govt. Code, Sec. 65995(b)(2).)

ENVIRONMENTAL JUSTICE

President Clinton's Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed on February 11, 1994. The order required the US Environmental Protection Agency (USEPA) and all other federal agencies to develop environmental justice strategies. The USEPA subsequently issued Guidelines that require all federal agencies and state agencies receiving federal funds, to develop strategies to address this problem. The agencies are required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.

SETTING

PROJECT LOCATION

The project site is located twelve miles north of Salinas in unincorporated Monterey County. The project is situated within the property boundary of the existing Moss Landing Power Plant Project. Moss Landing Power Plant Project has defined the

socioeconomic study area as a maximum reasonable commuting distance of about 90 minutes one-way commute for construction workers and operating employees. However, for purposes of determining construction worker availability and operation employees, staff considers the study area to consist of Monterey, Santa Cruz, and San Benito Counties. Although some project-generated economic benefits will occur throughout the entire three-county area, because the project is located in Monterey County, staff expects that Monterey County will receive the majority of the socioeconomic and fiscal impacts of the project.

IMPACTS

Staff reviewed the Moss Landing AFC, Vol. I, May 1999, executive summary, socioeconomic, and project description sections regarding potential impacts to community services and infrastructure (employment, housing, schools, utilities, emergency and other services), and environmental justice. Staff also reviewed the November 22, 1999 Supplemental Filing. Based on its independent analysis and the MLPPP socioeconomic data provided and referenced from governmental agencies and trade associations, staff finds the project will not have a direct impact on socioeconomic resources. However, analysis of the project's impact on worker safety and fire protection determined that the project will have a direct impact on fire services in the North County Fire Protection District. Please refer to **Worker Safety** for a discussion of the impact and proposed condition of certification.

Staff's criteria for assessing socioeconomic impacts are based on impacts to existing levels of service for medical services, law enforcement, fire and emergency services, and housing. Determination of impact is based on input from local agencies and service personnel. Environmental justice has a numeric threshold of 50 percent when determining the presence of minority and low-income populations. Regarding potential impacts to schools, public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities. Therefore, any project-related revenues to school districts can be imposed only through property taxes and statutory facility fees collected at the time the building permit is acquired.

CONSTRUCTION EMPLOYMENT AND PROJECT SCHEDULE

Figure 6.10-2 in the Supplementary Filing shows the workforce loading for project construction. Figure 6.10-2 indicates that project construction will occur over a 26-month period, with an average of 234 construction workers on site, and a maximum of 732 workers on site during peak construction. As indicated by Figure 6.10-2, peak construction is expected to last about four months. Specific trades required for construction include carpenters, laborers, ironworkers, operators, pipefitters, electricians, millwrights, boilermakers, insulators, painters, and teamsters. Based on employment information provided by Monterey County Building and Construction Trades (Table 6.10-9 in the AFC; Gonzales 1999), there appears to be a considerable surplus of construction workers available to staff the construction of the project. Mr. Gonzales of the Building and Construction Trades of Monterey and Santa Cruz Counties, indicated that the construction workforce is comprised of

workers from Monterey, Santa Cruz, and San Benito Counties. Therefore, no temporary or permanent relocation of workers is necessary for project construction.

PROJECT OPERATION

There are currently 88 people employed at the MLPPP. Table 6.10-10 in the AFC shows the current number and location of residence of each employee. Post-construction project operation is expected to create about ten new jobs (Duke Energy 1999a). The applicant assumes that the distribution of residences of new employees would be the same as for existing employees. However, the applicant does not know whether the ten new employees would be hired from the study area or hired from outside the region. Assuming worst-case, all ten employees would relocate to the study area and their location of residence would be similar to existing employees. Therefore, potentially ten new households would be created by the project. Based on the current distribution of MLPPP employees, seven households would locate in Monterey County, two would locate in Santa Cruz County, and one would locate in San Benito County.

Information obtained from the Association of Monterey Bay Area Governments (AMBAG) indicates that average household size varies by county for the tri-county area (Monterey 3.168; Santa Cruz 2.783; San Benito 3.159). Based on the average household sizes for each county, it is reasonable to assume that each worker who relocates to the area would have two dependents.

HOUSING

Housing characteristics provided in Table 6.10-5 of the AFC (State of California Department of Finance, City/County Population and Housing Estimates) give the number of housing units, vacancy rates, and number of vacant units for all cities and unincorporated communities in the four-county study area. Vacancy rates range from a low of 3.5 percent in Salinas to a high of 27.6 percent in Marina. Monterey County has an overall vacancy rate of 10.37 percent; Santa Cruz County has an overall vacancy rate of 8.99 percent. In addition to housing units, as of October 1997, there were about 12,100 motel/hotel rooms in Monterey County (Duke Energy 1999a). The applicant expects that hiring of construction workers will occur within the three-county project area. Therefore the potential demand for housing during construction is expected to be minimal to non-existent. Any potential demand for housing as a result of project construction can be accommodated by the existing vacancy rates in the cities and communities within the study area; any weekly-commuting construction workers can be accommodated by existing motel/hotel rooms in Monterey County. As stated above, ten new households with three persons per household may be created by the project. Based on housing characteristics in Table 6.10-5 in the AFC, the potential addition of ten new households in the study area does not represent a significant impact to housing.

SCHOOLS

The school district where development will occur is North Monterey County Unified School District. The North Monterey County Unified School District assesses developer fees of \$0.31 per square foot for commercial or industrial development (Duke Energy 1999d). MLPPP states that the project will total an estimated 10,197

square feet. Therefore, the MLPPP will be assessed a one-time developer fee of \$3,161. Developer fees can be spent on both temporary and permanent construction and on offices, multipurpose rooms, bathrooms, and other facilities, and transportation as well as classrooms. There is no way to determine which schools within the North Monterey County Unified School District will receive the fees or how they will be spent.

For this analysis, staff assumes that all dependents other than spouses will be school-aged children. Assuming that hiring of new employees will occur from outside the area, ten new employees with dependents will relocate to the study area in a similar locational pattern as existing employees. Therefore, staff estimates that ten children will attend schools in school districts in Salinas (seven school districts), Santa Cruz (four school districts) or Watsonville (one school district), and Hollister (five districts).

Table 6.10-7 in the AFC shows the school districts in the study area. In Salinas, three school districts are at capacity, three are under capacity, and no information is available for the other district; in Santa Cruz, one district is at capacity; in Watsonville information is not available for Pajaro Valley Unified School District; in Hollister, four school districts are under capacity; information is unavailable for the other district. From the school district information provided by the applicant and staff's independent analysis, staff finds that the potential of ten new students in the study area school districts will not constitute a significant impact.

MLPPP expects to hire construction workers from within the study area, and therefore does not expect construction workers and their families to relocate for the duration of the construction period. Staff's independent analysis on worker availability concurs with the findings of the applicant's, and staff does not expect any project-related adverse effects to the affected school districts as a result of project construction or operation. In addition, Senate Bill 50, signed by Governor Wilson on August 27, 1998, amended section 17620 of the Education code, and restricts school funding to property taxes and statutory facility fees collected at the time the building permit is acquired. 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." Therefore, any project-related revenues to school districts can be imposed only through property taxes and statutory facility fees collected at the time the building permit is acquired.

PUBLIC SERVICES

COMMUNITY PROTECTIVE SERVICES

The project is served by the Monterey County Sheriff's Department. The Department will not require expansion or increase in staffing to accommodate project construction or operation (Brassfield1999).

Fire protection and emergency response to the project is provided by the North County Fire Protection District Station One, located in Castroville, about 3 miles southeast of the MLPPP. District Station Three, located in Las Lomas about 7 miles

west of the project site, would provide back-up support. These stations have first responder HAZMAT capabilities. In addition, air ambulance services are available and coordinated through the North County Fire Protection District. Please refer to the section on **Worker Safety** for a discussion of existing equipment and personnel at each station.

Staff's review of District Chief Pereira's 1/10/00 letter and review of the **Worker Safety** section indicates that the North County Fire Protection District (District) does not have a ladder truck in its inventory to provide the elevated stream fire suppression and rescue capabilities required for the project. As mitigation for the direct impacts to fire protection services, the District is proposing that MLPPP purchase a ladder truck that will be located at Station One and provide funds for additional trained staff. Condition of Certification **Worker Safety-4** provides the mechanism for funding for this impact.

COMMUNITY MEDICAL SERVICES

Ambulance service is currently provided by American Medical Responders who transport to the Salinas Valley Memorial Hospital in Salinas, or Watsonville Community Hospital in Watsonville. Staff does not anticipate that project construction will place a significant demand on American Medical Responders, the Salinas Valley Memorial Hospital, or Watsonville Community Hospital (Downing 2000).

UTILITIES, WASTE MANAGEMENT, HAZARDOUS WASTE, WATER DEMAND, WASTEWATER DISPOSAL

Utility services in the MLPPP area are provided by Pacific Gas and Electric (PG&E). Please refer to the sections on **WATER RESOURCES** and **WASTE MANAGEMENT** for detailed discussions of water supply, water quality, wastewater disposal, and solid waste disposal.

IMPACT ON FISCAL RESOURCES AND THE LOCAL ECONOMY

PROPERTY TAX

In April 1999, the Board of Equalization Property Tax Committee formally agreed to assess only those companies that own generation facilities with a Certificate of Public Convenience and Necessity (CPCN). A CPCN is issued by the California Public Utilities Commission for non-merchant power plants. The property of all other companies owning generation facilities and selling electricity to the public would be county assessed. Therefore, the MLPPP as with all merchant plants, will be assessed by the county where sited. The applicant estimates the capitol cost of the project to be between \$400 and \$500 million dollars, therefore, based on the countywide property tax rate of 1.0 percent, the project is expected to generate between \$4 and \$5 million in property taxes in Monterey County each year (Duke Energy 1999a). The revenue will be collected by Monterey County and distributed among 177 separate entities. About 47 percent is allocated to county school districts, 26 percent to the county general fund, 0.8 percent to hospitals, and 0.1 percent to Moss Landing Harbor District (Duke Energy, Monterey County Tax Collector's Office 1999).

LOCAL PURCHASING OF EQUIPMENT AND SUPPLIES

The estimated total construction payroll is about \$136 million. The MLPPP estimates that local purchases of materials and supplies during construction would be about \$11 million (Duke Energy 1999a). The cumulative MLPPP modernization will result in an estimated state sales tax increase from \$19 to \$22 million per year; the allocation to Monterey County will increase from about \$2.0 to \$2.5 million per year.

ENVIRONMENTAL JUSTICE SCREENING ANALYSIS

For all siting cases, Energy Commission staff follows the federal guidelines' two-step screening process. The process assesses:

- whether the potentially affected community includes minority and/or low-income populations; and
- whether the environmental impacts are likely to fall disproportionately on minority and/or low-income members of the community.

Depending on the outcome of the screening process, local community groups are contacted to provide the Energy Commission with a fuller understanding of the community and the potential environmental justice issues. In addition, local community groups are asked to help identify potential mitigation measures.

EPA's April 1998 "Guidance For Incorporating Environmental Justice Concerns In EPA's NEPA Compliance Analyses" (Guidance) provides a numeric measure to determine the presence of an affected population: a minority population exists if the minority population percentage of the affected area is fifty percent or greater than the affected area's general population. The Guidance does not define the term "affected area", however it states that the analyst should interpret the term "as that area which the proposed project will or may have an effect on." Typically, Energy Commission staff has defined the affected area as the area potentially impacted by the proposed project (primarily for air quality, public health, noise, water, traffic and visual). The affected area for the MLPPP was initially determined by Energy Commission staff as that area within a five-mile radius of the site and represents the area affected by various project emissions. Please refer to the section on Air Quality for a discussion of criteria pollutants, ambient air quality, and cumulative impacts.

SOCIOECONOMICS TABLE 1 contains 1999 population estimates for each census tract in the five-mile area of the MLPPP. Data for this table were obtained from the marketing firm of Claritas. Claritas produces demographic estimates and projections based on data solicited from local, state, and federal government agencies, and private sector sources. Sources include U.S. Bureau of Labor Statistics, U.S. Bureau of the Census, U.S. Postal Service, and city and regional planning departments. According to the guidelines, a minority population exists if the minority population percentage of the affected area is fifty percent or greater than the affected area's general population. Based on the screening process for environmental justice, information in **SOCIOECONOMICS TABLE 1** indicates that the minority population of the affected area is 58.5%.

SOCIOECONOMICS Table 1
Demographic Profile for Census Tracts Within Five Miles of the MLPPP Site

Census Tract	Hispanic Origin	White	Black	American Indian	Asian Pacific Islander	Other Race	Total by Tract
010198	4795	1668	17	14	280	24	6798
010201	2614	762	2	38	241	13	3670
010202	1385	2062	15	33	139	14	3648
010301	1574	5740	175	85	617	19	8210
010302	687	1005	27	14	69	3	1805
0104	3999	445	63	17	251	22	4797
012301	26	713	48	3	135	0	925
Totals	15080	12395	347	204	1732	95	29853
% of Totals	50.5%	41.5%	1%	<1%	5.8%	<1%	

Source: Claritas. Race and Hispanic Origin population estimates for 1999

The poverty threshold for a family of four persons was \$12,674 per year (1990 US Census Data). To determine the number of persons below the poverty level, Energy Commission staff reviewed data from the 1990 US Census: Poverty Status By Age; Universe: Persons for whom poverty status is determined (the aggregate number of persons five years and under to seventy-five years and over).

SOCIOECONOMICS TABLE 2 indicates that the total number of people living below the poverty level is 3,603, or about 11.5 percent of the total population of the census tracts within five miles of the MLPPP site. As stated above, a minority population exists if the minority population percentage of the affected area is fifty percent or greater than the affected area's general population. Because the guidelines do not give a percentage of the population as a threshold to determine the existence of a low-income population, Energy Commission staff used the fifty-percent threshold used for minority populations.

SOCIOECONOMICS Table 2
Percentage of Persons Living Below the Poverty Level Within Five Miles of the MLPPP Site

Census Tract	Number of Persons in Tract	Persons Below Poverty Level
010198	7397	889
010201	3791	364
010202	3747	150
010301	8451	742
010302	1858	327
0104	5272	1057
012301	942	74
Totals	31458	3603

Source: 1990 US Census Data, Statistical Information on Population

The screening analysis indicates that there are 58.5 percent minorities living within the project's affected area. Environmental analysis for air quality shows that the maximum impact for all criteria pollutants is below the standards. Based on the air quality analysis, staff finds that there is no significant and adverse impact on minority populations in the area. Please refer to the section on Air Quality for further discussion.

CUMULATIVE IMPACTS

Figure 6.10-3 in the Supplemental Filing shows the workforce loading for cumulative (selective catalytic reduction installation, demolition of existing oil tanks, and project) onsite activities. Cumulative onsite activities will occur over a 35-month period and will employ a maximum of about 732 construction workers during the peak construction period.

The project consists of three components: demolition of existing fuel oil storage tanks and related environmental cleanup; the installation of selective catalytic reduction (SCR) to Units 6 and 7; and project construction. For purposes of determining the availability of local construction labor and socioeconomic impacts to the project area, staff will consider the "project" to include all three components. As shown in Table 6.10-9 in the AFC (Cumulative Construction Labor Needs And Available Labor By Craft), the number of workers from the tri-county area is more than adequate for the cumulative workforce requirements. As stated earlier, because of the availability of local labor, Energy Commission staff does not expect any adverse cumulative impacts to schools, police, or housing.

MITIGATION

Because the applicant has identified economic and fiscal benefits to the project area through sales tax and direct purchases of construction materials and services from local vendors (Duke Energy 1999a), Energy Commission staff is proposing a condition of certification to ensure that some economic benefit occurs in the project area.

FACILITY CLOSURE

Energy Commission staff does not know of any Socioeconomic LORS related to facility closure. Facility closure would have to comply with the Facility Closure conditions of certification contained in the **FACILITY CLOSURE** section of the PSA.

CONCLUSION AND RECOMMENDATION

The applicant has identified economic and fiscal benefits to the project area. To ensure that some economic benefit occurs in the project area, Energy Commission staff has proposed a condition of certification that requires the project owner and its contractors and subcontractors to recruit employees and procure materials and supplies locally. If the Energy Commission certifies the proposed project, staff recommends that it adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies within Monterey, Santa Cruz, and San Benito Counties first unless:

- to do so will violate federal and/or state statutes;
- the materials and/or supplies are not available; or
- qualified employees for specific jobs or positions are not available; or
- there is a reasonable basis to hire someone for a specific position from outside the local area; or
- to do so would violate union agreements.

Verification: At least 60 days prior to the start of construction, the project owner shall submit to the Energy Commission Compliance Project Manager (CPM) copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CPM in each Monthly Compliance Report of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months. The CPM shall review and comment on the submittal as needed.

SOCIO-2 The project owner shall pay the statutory school facility development fee and fire facilities fee as required at the time of filing for the “in-lieu” building permit with the Monterey County Building Department.

Verification: The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

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GEOLOGY AND PALEONTOLOGY

Testimony of Robert Anderson

INTRODUCTION

The geology 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. 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 nine conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicable LORS are listed in the AFC, in Sections 6.14, 6.16, and 6.17 Moss Landing Power Plant Project (MLPPP 1999a). A brief description of the LORS for paleontological resources, geological hazards and resources, and drainage and erosion control follows:

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control. The United States Bureau of Land Management (BLM) requires an excavation permit for excavations and grading on land under their jurisdiction. The Moss Landing Power Plant Project (MLPPP) is not located on lands under the jurisdiction of the BLM. Therefore, there are no federal LORS with respect to geological hazards or resources, or paleontological resources, that are applicable to this project.

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) that were based upon the UBC that includes supplemental standards specific to California. The CBC supplements their 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) 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 project is located near the east side of Moss Landing Harbor and within the limits of the existing Moss Landing Power Plant and related properties, in Monterey County. Other nearby surface water bodies include the Elkhorn Slough to the north of the site the Old Salinas River Channel which is southwest of the site, the Moro Slough which is south of the site, Bennett Slough which discharges into Moss Landing Harbor in the Northeaster corner of the harbor, and Monterey Bay west of Moss Landing Harbor. Geology of the site is made up of several earth units and fill. The earth units found at the site include basin sediments made up of interbedded clay, sand, and silt beds, beach sands, dune sands, wind blown sands, and coastal terrace deposits.

ANALYSIS AND IMPACTS

FAULTING AND SEISMICITY

No active faults are known to cross the proposed power plant footprint or the Pacific Gas and Electric substation located adjacent to the site. The potential of surface rupture on a fault at the power plant footprint is considered to be very low, since no faults are known to cross the proposed power plant location. The site is located in CBC seismic zone 4 as depicted in CBC Figure 16-2. This calls for a minimum ground acceleration for a project within the zone to be designed to 0.4g (0.4X 9.8 meters per second per second). The closest known fault to the power plant footprint is the Monterey Canyon fault. This fault is located approximately to the 1 mile west of the site. It is not considered to be an active fault. However, if a major earthquake occur on the eastern end of the fault, the project site may experience surface rupture and strong ground shaking should the fault be propagated through the project site. The closest active fault to the site is the Zayante-Vergeles fault which is located approximately 6 miles east-northeast of the fault. This fault is considered to be a minor part of the San Andreas fault system. The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the California Building Code. The estimated peak horizontal ground acceleration for

the power plant associated with a magnitude 7.9 earthquake on the San Andreas fault at a distance of eleven miles from the site is 0.36g. Two major earthquakes have affected the site within the last 100 years, the 1906 San Francisco earthquake and the 1989 Loma Prieta earthquake. Surface rupture from the magnitude 8.3 1906 San Francisco earthquake has been reported by the applicant to have been recorded to be in San Juan Bautista, which is located about 12 miles east of the site. No reliable record of the estimated peak horizontal ground acceleration at the site caused by the 1906 San Francisco earthquake is known by Energy Commission staff to exist.

The epicenter of the magnitude 7.1 October 1989 Loma Prieta earthquake was located approximately 18 miles north of the project site. The power plant had a raw water tank damaged and some minor damage to the liner of one of the cooling towers. Six inches of earthquake induced subsidence was also reported to have been observed near the gas metering station. The applicant has indicated that the peak estimated horizontal ground acceleration at the site during the Loma Prieta earthquake was between 0.2 to 0.3g (MLPPP AFC page 6.3-6). However, the Earthquake Engineering Research Institute, May 1990, indicated that the peak horizontal ground acceleration that may have occurred at the MLPPP site was probably closer to 0.39g.

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. During the 1989 Loma Prieta earthquake liquefaction related soil features were reported in the vicinity of the power plant and Moss Landing harbor. The potential for liquefaction at the site is considered to vary from low to high due to the presence of ground water within the upper 10 feet of the soil column, the distribution of loose semi-consolidated to consolidated cohesionless soils that partially make up a portion of the geology at the site, and the potential of moderately high levels of strong ground shaking (0.36g), due to a large earthquake on the San Andreas fault.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The soils at the site are partially saturated soil conditions so that hydrocompaction is not considered to be a significant problem at the power plant location.

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. A ten-foot thick layer of highly plastic clay is located near the existing hazardous waste ponds and the oil-water separator. This unit is considered to be potentially expansive. The applicant has indicated in the ASFC that they will assess the potential for expansive soils during the project geotechnical engineering investigation that is planned to occur prior to establishing the final design for the project.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

Energy Commission staff have reviewed the MLPPP AFC, dated May 1999. No geological resources have been identified at the power plant project site. No fossils were observed by Energy Commission staff at the power plant during a site visit on November 9, 1999. No paleontological resources are known to exist at the power plant footprint and the re-powering project construction area. The coastal sand terrace deposits may contain fossils at the site, but none are known to have been encountered. The coastal terrace deposits are considered to be paleontologically moderate sensitive due to the discovery of a mammoth bone in the deposit near Watsonville. Energy Commission staff concur with the applicant that the basin sediments, coastal dunes, the beach dunes, and the wind blown sand deposits and fill have a low paleontological sensitivity. Therefore, 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 site is located in Federal Emergency Management Agency Flood Insurance Rate Map designation "C" and is not located in a 100-year flood zone. In addition, the site is not in a tsunami run-up zone. Minimum grade for the power plant area will be 1% and all drainage will be directed away from buildings within the footprint. The 100-year 24-hour storm event precipitation amount is 3.5 inches (NOAA 1973). Run-off during a 100-year 24-hour storm event should not overwhelm the capacity of the proposed surface water drainage system.

SITE SPECIFIC IMPACTS

The project is not likely to have any impact on geological or paleontological resources, surface water resources, or 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 MLPP 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

There are three kinds of 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.

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. Energy Commission staff agree with the applicant that there is a low probability that vertebrate fossils will be encountered during construction of the power plant and related features.

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. To ensure compliance with applicable LORS for geological hazards, geological and paleontological resources and surface water hydrology, staff recommends the adoption of the proposed conditions of certification listed below.

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 CPM (the functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license).

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit to the 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 needed. 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.

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, for the intended use, of the site 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 CPM and the CBO.

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 approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the 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 designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist 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 are not in concert with the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist 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 designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Verification: At least ninety (90) days prior to the start of construction, the project owner shall submit the name and resume and the availability for its designated paleontological resource specialist, 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 designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to

implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994) the Paleontological Resources Monitoring and Mitigation Plan 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 designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
- 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 sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, 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 designated paleontological resource specialist 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.

Protocol: 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 designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least (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 designated paleontological resource specialist, 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 designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological 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 designated paleontological resource specialist.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and

collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated. The owner shall submit to the curation facility a copy of the approved Paleontological Resources Report has been approved by the CPM.

Verification: The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials. Within 15 days of receiving notice from the CPM that the Paleontological Resources Report has been approved, the project owner shall submit a letter to the CPM stating that a copy of the approved Paleontological Resources Report has been transmitted to the curation facility.

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 twelve 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 Paleontological Resources Report 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

Benuska, L. (editor). May 1990. Loma Prieta Earthquake Reconnaissance Report, in Earthquake Spectra, Earthquake Engineering Research Institute, Supplement to Volume 6, Page 210. May 1990.

CDMG (California Division of Mines and Geology). 1994a. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions.

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project Plant Project. Submitted to the California Energy Commission, March 3, 1999.

NOAA (National Oceanic and Atmospheric Administration). 1973. Precipitation-Frequency Atlas of the Western United States. Page 71.

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 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] (d)(1) Findings regarding the conformity of the proposed site and related facilities...with public safety standards...and with other relevant local, regional, state and federal standards, ordinances, or laws..."(Pub. Resources Code, §25523).

SUBJECTS DISCUSSED

Subjects covered in this analysis include:

- Identification of the LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring protection of the environment and public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable LORS;
- 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
- 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

Duke Energy Moss Landing LLC (Duke Energy or the applicant) proposes to construct and operate the proposed 1060-megawatt (MW) Moss Landing Power Plant Project (MLPPP) (Duke Energy 1999h and 1999i). The proposed project will be located at the existing Moss Landing Power Plant site that has been operated by PG&E for almost 50 years. This site is located at the intersection of Highway 1 and Dolan Road, east of the community of Moss Landing near the Moss Landing Harbor. The proposed project will use seawater for once through cooling. For more information on the site and related project description, please see the **Project Description** section.

The project site is located in the northwest quarter of Township 13 South, Range 2 East, San Bernardino Base and Meridian. The site is in seismic zone 4, the highest seismic shaking zone in the country. Additional engineering details of the proposed project are contained in the Application for Certification (AFC), in Appendices 8-3 through 8-8 (MLPPP 1999a).

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 8-3 through 8-8, and summarized in Section 7.3, Table 7-1 and Section 8, Engineering (MLPPP 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 1.4.6	Project Schedule
Section 1.4.7	Project Ownership
Section 2	Project Description
Section 7	Laws, Ordinances, Regulations and Standards (LORS)
Section 7.3	Project Siting, Design and Construction
Section 8	Engineering

Appendices

1. Appendix 8-3	Civil Engineering Design Criteria
2. Appendix 8-4	Structural Engineering Design Criteria
3. Appendix 8-5	Mechanical Engineering Design Criteria

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| 4. Appendix 8-6 | Electrical Engineering Design Criteria |
| 5. Appendix 8-7 | Control Systems Engineering Design Criteria |
| 6. Appendix 8-8 | Chemical Engineering Design Criteria |

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Appendix 8-3 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 (MLPPP 1999a, Section 8, and Appendices 8-3 and 8-4) 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 MLPPP 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

¹The CBO is the CEC's duly appointed representative, who may be the City or County Chief Building Official, or other appointed representative.

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:

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.)

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:

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.)

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.)

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 NONBUILDING STRUCTURES

Nonbuilding 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 plans to modernize the MLPPP. The modernization will include: Demolition. Demolition of the existing, unused fuel oil storage tanks and related environmental cleanup.

Selective Catalytic Reduction (SCR) Installation. Addition of SCR to Units 6 and 7. The Project. The replacement of Units 1 through 5 (613 MW) with two combined-cycle units for a combined capacity of 1,060 MW, and demolition of eight 225-foot tall stacks previously used in the operation of Units 1 through 5.

Balance of plant (BOP) required to incorporate the project into the existing plant operations include transmission tie-in from the new combined-cycle units to the adjacent Pacific Gas and Electric (PG&E) Moss Landing switchyard, two 145-foot tall stacks, and the installation of three natural gas compressors and associated gas line extensions from the adjacent PG&E gas meter and regulator yard. Cooling water will be supplied using the existing Units 1 through 5 seawater intake structure and discharged through the existing Units 6 and 7 outfall.

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

Each of the two new natural gas-fired combined-cycle units is expected to produce a nominal 530 MW of electrical output under average conditions. Each unit will include two natural gas-fired combustion turbine generators (CTGs), two unfired heat recovery steam generators (HRSGs), and a reheat, condensing steam turbine generator (STG) in a "2-on-1" configuration. Each unit will utilize seawater for once-

through cooling. Associated equipment will include emission control technologies necessary to meet required air quality standards.

Each CTG will exhaust to a dedicated HRSG. Each HRSG is a horizontal, natural circulating type unit with three pressure levels of steam generation and a reheat loop. The CTGs will be equipped with dry low nitrogen oxide (NO_x) combustors used to control NO_x. The HRSG will be equipped with a selective catalytic reduction (SCR) system, utilizing aqueous ammonia, and associated support equipment.

Other features of the project include: water and wastewater treatment equipment; pressure vessels, piping systems and pumps; aqueous ammonia storage, handling and piping system; air compressors; fire protection systems; and heating, ventilation, air conditioning (HVAC), potable water, plumbing and sanitary sewage systems.

MECHANICAL LORS AND DESIGN CRITERIA

The application (MLPPP 1999a, Appendix 8-5) 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 (MLPPP 1999a, Appendix 8-6). Almost all of the power produced by the project will be delivered to the plant's interconnection with PG&E.

Power and Control Wiring. In general, conductors will be insulated based on a normal maximum conductor temperature of 90°C in 40°C ambient air with a maximum emergency overload temperature of 130°C and a short circuit temperature of 250°C. 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 (MLPPP 1999a, Appendix 8-6) 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 (MLPPP 1999a, Appendix 8-6). Staff has proposed conditions of certification (**ELEC-1** and **ELEC-2**, below) to monitor this compliance.

ANCILLARY FACILITIES

The existing transmission, gas and water facilities can accommodate the additional load with only minor modifications. New pipelines and electrical transmission lines will not be required, except for short segments within the MLPPP to connect the Project to the existing fuel supply and electrical transmission facilities. Additional intake or discharge structures for cooling water will not be required.

EMISSION CONTROLS

NO_x emissions from the combustion process will be reduced to 2.5 parts per million by volume dry (ppmvd), or less, at 15 percent oxygen, by utilizing dry low NO_x combustion technology and a SCR system. The SCR system will use aqueous ammonia for the reduction process.

PROJECT QUALITY PROCEDURES

The AFC (MLPPP 1999a, § 8.3.2.9) 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:

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.

Staff will propose a memorandum of understanding (MOU) with Monterey 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.

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 MLPPP's 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 are 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 Monterey County for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

Proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;

All applicable LORS, local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;

The activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and

Decommissioning alternatives, other than complete site restoration.

UNEXPECTED TEMPORARY CLOSURE

Under this scenario, it is expected that the facility is closed unexpectedly, on a short-term basis. Natural disasters, such as an earthquake or severe storm, can cause an unexpected temporary closure of the facility. If damage to the facilities is too great, the temporary closure may become permanent.

If the facility is closed on a temporary basis, the applicant shall secure the site in order to protect public health and safety. If temporary closure becomes permanent, the applicant shall follow the "Planned Closure" procedures outlined 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. To ensure that these measures are included in the Facility Closure Plan, 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 perform 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 project² in accordance with the 1998 California Building Code (CBC)³ and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.

Protocol: In the event that a successor to the 1998 CBC is in effect when the initial design plans are submitted to the CBO, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

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

² Conformance with applicable LORS related to the project switchyard, switching stations, substations and transmission lines are addressed in conditions of certification TSE-1, 2 and 3.

³ The Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to the Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).

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	Quantity Plant	Size/ Capacity*	Remarks
Combustion Turbine Generator	4	172 MW each	DLN combustion control
Heat Recovery Steam Generator	4		Three pressure with reheat. No duct firing
Aqueous Ammonia Storage Tank	1	33,000 gal	For NO _x control
Ammonia Injection Blower	8		Two per HRSG
High Pressure/Intermediate Pressure (HP/IP) Boiler Feedwater pump	4	910/300 gpm	HP feed with interstage bleed
Desalination Evaporator	1	100 gpm	50% recovery vapor compression
Oily Water Separator	1	100 gpm	CPI separator package
Air Compressor	2	300 scfm	Service and instrument air
Steam Turbine Generator	2	196 MW	Reheat/Condensing
Steam Surface Condenser	2	1,160 MMBtu/hr	Sea water
Condensate Pump	4	3,100 gpm	Vertical turbine
Circulating Water Pump	6	42,000 gpm	
Fuel Gas Filter/Separator	1	330,000 lb./hr	For natural gas fuel
Demineralized Water Package	1	100 gpm	Two "trains"
Demineralized Water Pump	3	100 gpm	HRSG Makeup water & CT water wash
Demineralized Water Tank	1	500,000 gal	For cycle makeup water & CT water wash
Continuous Emission Monitoring System	4		
Blow Down Recovery Tank	2	50,000 gal	24 hours each

***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 Monterey 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 project⁴ [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities).]

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

⁴ Conformance with applicable LORS related to the project switchyard, switching stations, substations and transmission lines are addressed in conditions of certification TSE-1, 2 and 3.

- 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 project⁵: 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.]

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.

⁵ Conformance with applicable LORS related to the project switchyard, switching stations, substations and transmission lines are addressed in conditions of certification TSE-1, 2 and 3.

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 project⁶, 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.

Protocol: The special inspector shall:

⁶ Conformance with applicable LORS related to the project switchyard, switching stations, substations and transmission lines are addressed in conditions of certification TSE-1, 2 and 3.

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 Monterey 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 MLPPP 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 Monterey 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;
4. Turbine/generator pedestal; and
5. Switchyard structures.

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: $I = 1.25$, $I_p = 1.5$ and $I_w = 1.15$.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping system (exclude domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter 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.]

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.⁷ These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests.]

Protocol: The following activities shall be reported in the Monthly Compliance Report:

- 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

⁷ Conformance with applicable LORS related to the project switchyard, switching stations, substations and transmission lines are addressed in conditions of certification TSE-1, 2 and 3.

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 CBO⁸ 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.]

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 1. 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.

⁸ Conformance with applicable LORS related to the project switchyard, switching stations, substations and transmission lines are addressed in conditions of certification TSE-1, 2 and 3.

REFERENCES

- Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.
- Duke Energy. 1999c. Data Adequacy Supplemental filing, dated July 30, 1999.
- Duke Energy. 1999d. First set of Data Responses 1-24, dated October 4, 1999.
- Duke Energy. 1999h. Letter describing changes to Moss Landing Power Plant Project –i.e., upgrade change to existing Units 6 & 7, submitted to the California Energy Commission on September 7, 1999.
- Duke Energy. 1999i. Duke Energy supplemental to the AFC detailing upgrade changes to Units 6 & 7. Submitted to the Energy Commission on November 22, 1999.

POWER PLANT RELIABILITY

Testimony of Steve Baker

INTRODUCTION

In this analysis, staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. 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.

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 Duke Energy Moss Landing LLC (Duke Energy, the applicant) has predicted a level of reliability for the power plant (see below), staff believes the applicant should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (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.

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 only now 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 considered 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 maintenance expenditures will act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

Duke Energy proposes to operate the 1,060 MW combined cycle portion of the project at baseload, selling energy on the market. In addition, the applicant proposes to provide local power system support by selling ancillary services, including peaking, turndown, voltage support and reactive power support. This portion of the project is expected to operate at an overall availability of 92 to 96 percent, at a capacity factor determined by market demand and projected to lie between 50 and 90 percent (Duke Energy 1999a, AFC §§ 1.1, 1.2, 2.3.3.1, 2.3.3.5, 8.3.1, 8.5.2.2.1).

In addition, the applicant proposes to upgrade the existing Moss Landing Units 6 and 7, two 750 MW steam boiler units built in the mid-1960s. Concurrently with the installation of air emissions control hardware, the steam turbine rotors of these units

will be replaced with upgraded rotors, increasing power output from each unit by 15 MW. The refurbished Units 6 and 7 are projected to operate at a capacity factor of 40 percent (Duke Energy 1999a, AFC §§ 1.1, 1.4.3, 2.0, 2.1.1, 2.2.2, 2.3.3.1, 2.3.3.3, 8.1, 8.3.2, 8.5.2.2.2; Duke Energy 1999h).

ANALYSIS

A reliable power plant is one that is available when called upon to operate. 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 MLPPP and compares them to industry norms. If they compare favorably, staff can conclude that the MLPPP will not degrade utility system reliability.

Throughout its intended life, the project will be expected to perform reliably in baseload, load following and peaking duty. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. This requirement for equipment availability is typically addressed by control of quality in machinery design, construction, and installation. Plant reliability is further assured by providing for plant maintainability and sufficient redundancy of critical equipment, fuel and water availability, and resistance to natural hazards.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

The QA/QC program delineated by the applicant (Duke Energy 1999a, AFC §§ 8.5.2.1, 8.5.2.2.3, 8.5.2.2.4) 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. 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.

The applicant plans to provide appropriate redundancy of function for the combined cycle portion of the project (Duke Energy 1999a, AFC § 8.5.2.2.3). Although no

specific list of redundant equipment appears in the application, Duke Energy's reputation as one of the nation's preeminent electric utilities lends confidence that the MLPPP will be designed with an adequate level of equipment redundancy. Additionally, the fact that the project consists of four parallel trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other trains to fail, thus allowing the plant to continue to generate (at reduced output). 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.

The applicant proposes no additional redundant equipment for the upgraded Units 6 and 7 (Duke Energy 1999a, AFC § 8.5.2.2.3). In light of the extensive experience that the plant's owners have had with these units, staff rates current reliability as adequate, and fully expects that it will be maintained in the future.

MAINTENANCE PROGRAM

The applicant proposes to establish a plant maintenance program typical of the industry (Duke Energy 1999a, AFC §§ 2.3.3.5, 8.5.2.1, 8.5.2.2.4). The program will encompass preventive and predictive maintenance techniques, employing both plant maintenance staff and contractors. Maintenance outages will be planned for periods of low electricity demand. In conjunction with an overall plant quality control program (Duke Energy 1999a, AFC § 8.5.2.2.4), 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.

The MLPPP will burn natural gas from the existing PG&E interstate pipeline system, transmitted to the plant via two existing 20-inch and 24-inch diameter pipelines (Duke Energy 1999a, AFC §§ 1.4.4, 2.3.3.11, 8.5.1.1). The PG&E natural gas system, which provides access to gas from the Southwest, the Rocky Mountains and Canada, represents a resource of considerable capacity. This system offers access to far more gas than the plant would require (Duke Energy 1999a, AFC § 8.5.1.1). Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

The MLPPP will use seawater for cooling the steam turbines' condensers, and desalinated seawater for all power cycle makeup uses. Fire water and domestic water for normal and sanitary plumbing system use will be obtained from existing groundwater wells at the project site. Bottled water will be provided to satisfy drinking water needs (Duke Energy 1999a, AFC §§ 1.1, 1.4.5, 2.1.1.7, 2.3.3.6, 8.3.1.1, 8.3.1.2, 8.5.2.2.5). Staff regards this arrangement as an adequately reliable supply.

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, flooding,¹ tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but seismic shaking (earthquake) presents a credible threat to reliable operation (see those portions of this document entitled **Facility Design** and **Geology**).

The site lies within Seismic Zone 4 (Duke Energy 1999a, AFC §§ 1.5.12, 2.3.3.10). No active earthquake faults lie nearby. 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 (see that section of this document entitled **Facility Design**.) By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

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 1993 through 1997 (NERC 1998):

For Combined Cycle units (All MW sizes)

Availability Factor = 91.10 percent

The General Electric gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor from 92 to 96 percent (Duke Energy 1999a, AFC § 2.3.3.5) is quite 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 gas turbines that make up the NERC statistics. Further, since the plant will consist of four 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 (Duke Energy 1999a, AFC § 8.5.2.1). 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.

¹ The project site lies outside any 100-year flood plains (Duke Energy 1999a, AFC § 2.3.2).

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**.

CONCLUSION

The applicant predicts an equivalent availability factor from 92 to 96 percent, 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.
- Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.
- Duke Energy. 1999h. Letter describing changes to Moss Landing Power Plant Project, i.e., upgrade change to existing Units 6 & 7, submitted to the California Energy Commission on September 7, 1999.
- Mavis, Steve. 1998. Transmission Planner, California Independent System Operator. Telephone conversation with Steve Baker (California Energy Commission), January 23, 1998.
- McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. *Operational Experience in Competitive Electric Generation, an Executive Report*, 1994.
- NERC (North American Electric Reliability Council). 1998. 1993-1997 Generating Availability Report.

POWER PLANT EFFICIENCY

Testimony of Steve Baker

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Moss Landing Power Plant Project (MLPPP) 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 MLPPP'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

Duke Energy Moss Landing LLC (Duke Energy, the applicant) proposes to construct and operate a (nominal) 1,060 MW combined cycle power plant to generate baseload power and provide local power system support (peaking, turndown, voltage support, reactive power support). The combined cycle portion of the MLPPP will consist of four General Electric PG7241 “F-class” combustion turbine generators producing approximately 170 MW each, four heat recovery steam generators (HRSGs) and two 190 MW reheat steam turbine generators, totaling approximately 1,060 MW (Duke Energy 1999a, AFC §§ 2.3.3.2, 8.3.1, Fig. 8.3, Fig. 8.4, Appendix 8-1).

Further, Duke Energy will upgrade two existing 750 MW supercritical steam boiler units, Moss Landing Units 6 and 7. These units, built in the mid-1960s, must be retrofitted with selective catalytic reduction (SCR) systems for control of air emissions; installation of SCR involves replacement of the forced draft fans on the boilers, as well as the installation of induced draft fans. Duke Energy will use this opportunity to concurrently replace the Units 6 and 7 steam turbine rotors with new, upgraded rotors that will yield an additional 15 MW output per unit (Duke Energy 1999a, AFC §§ 1.1, 1.2, 1.4.3, 2.1.1, 2.1.2, 2.2.2, 2.3.3, 2.3.3.5, 8.3.1, 8.6.1, 8.6.2, Appendix 8-1; Duke Energy 1999h).

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;
- 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 MLPPP will burn natural gas at a maximum rate exceeding 142 billion Btu per day LHV¹ (Duke Energy 1999a, AFC § 8.6.1). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

Under expected project conditions, electricity will be generated by the combined cycle plant at a peak load efficiency of approximately 55.6 percent LHV. The upgraded Units 6 and 7 will generate electricity at an annual average (assuming a 40 percent capacity factor in load-following and peaking duty) of 43.5 percent LHV

¹ Lower heating value.

(Duke Energy 1999a, AFC § 8.6.1). Compare these figures 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 source of supply of natural gas for the MLPPP (Duke Energy 1999a, AFC §§ 1.4.4, 2.3.3.11, 8.5.1.1). The project will burn natural gas from the Pacific Gas & Electric (PG&E) interstate pipeline system, which draws gas from the Southwest, the Rocky Mountains, and Canada. These sources represent far more gas than would be required for a project this size. It is highly unlikely that the MLPPP 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 two existing 20-inch and 24-inch diameter pipelines from the PG&E regulator station in Hollister, approximately 25 miles to the east (Duke Energy 1999a, AFC §§ 1.4.4, 2.3.3.11). The natural gas supply system in California is so large and well-established, there is no real likelihood that the MLPPP will require development of new sources of energy.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the MLPPP or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT AND UNNECESSARY ENERGY CONSUMPTION

The MLPPP 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 MLPPP will be configured as a double compound-train combined cycle power plant, in which electricity is generated by four gas turbines, and additionally by two reheat steam turbines that operate on heat energy recuperated from the gas turbines' exhaust. By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The number of turbines further contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back.

Rather than being forced to throttle back one large turbine, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one or more gas turbines. 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 peaking and load-following duty. Loads down to 25 percent of full load allow one gas turbine, operating at full load, and its 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 MLPPP represent some of the most modern and efficient such machines now available. The applicant will employ combined cycle power trains from a prominent manufacturer: the General Electric PG7241, an “F-class” gas turbine nominally rated in a two-on-one train combined cycle at 530 MW and 56.5 percent efficiency LHV at ISO² conditions (Duke Energy 1999a, AFC §§ 1.1, 1.4.2, 2.2.1, 8.3.1; GTW 1998).

One possible alternative to the General Electric machine selected is the Siemens-Westinghouse 501F, an “F-class” machine nominally rated in a two-on-one train combined cycle configuration at 546 MW and 55.8 percent efficiency LHV at ISO conditions (GTW 1998). Another possible alternative is the ASEA Brown-Boveri KA-24, another “F-class” machine. While the KA-24 promises slightly higher fuel efficiency (57.9 percent) (GTW 1998) 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 some advantage here.

EFFICIENCY OF ALTERNATIVES TO THE PROJECT

The project objectives include generation of baseload and peaking electricity and ancillary services, as market conditions dictate; and improving local system reliability while reducing system losses (Duke Energy 1999a, AFC §§ 1.2, 1.2.2, 2.1.1, 2.3.3.5, 8.3.1, 8.5.2.2.1).

Alternative Generating Technologies

The applicant addresses alternative generating technologies in its application (Duke Energy 1999a, AFC §§ 5.5, 5.6). Oil-burning, coal-burning, solar, wind, hydroelectric, biomass, municipal solid waste, fuel cells, ocean energy, nuclear and geothermal technologies are all considered. Given the project objectives, location and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible for the MLPPP.

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).

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft jet engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the best available fuel efficiency, but at the same time sells for the lowest per-kilowatt capital cost.

The applicant addresses alternative gas-fired generating technologies in the application (Duke Energy 1999a, AFC §§ 5.5, 5.6). Rankine cycle (steam boiler), Kalina cycle, steam-injected gas turbine, intercooled gas turbine, chemically recuperated gas turbine, and humid air gas turbine cycles are all considered and rejected for reasons of either fuel efficiency, economics or commercial availability.

One possible alternative to an "F-class" gas turbine is the Siemens-Westinghouse 501G gas turbine generator, a "G-class" machine that employs partial steam cooling to allow slightly higher temperatures, yielding greater efficiency. The 501G is rated at 58 percent efficiency, 1.5 percent higher than the General Electric Frame 7F, and produces 367 MW to the 7F's 530 MW; a three-train "G-class" power plant would produce a nominal 1,100 MW. However, the 501G is brand new; the first such machine is now in startup at a site in Florida owned by Lakeland Electric and Water (Power 1999). Given the minor efficiency improvement promised by the "G-class" turbine and the lack of a proven track record for the 501G, the applicant's decision to purchase "F-class" machines is a reasonable one.

A further choice of alternatives involves the employment of gas turbine inlet air cooling. The two commonly used techniques are the evaporative cooler and the chiller; both devices increase gas turbine power output in hot weather by cooling the gas turbine inlet air. Due to the mild marine environment at Moss Landing, however, there is little benefit to be had from inlet air cooling. Duke has thus decided not to employ this feature on the MLPPP; staff concurs with this decision. (Note that this will provide a side benefit, a reduction in consumption of fresh water.)

CUMULATIVE IMPACTS

There are no nearby power plant projects that hold the potential for cumulative efficiency impacts when aggregated with the MLPPP.

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.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The MLPPP, if constructed and operated as proposed, would generate 1,060 MW of electric power at an overall project fuel efficiency of approximately 56 percent, and add 30 MW of capacity to the existing Moss Landing Units 6 and 7 at an efficiency of approximately 44 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 MLPPP would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resource 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 MLPPP. No Conditions of Certification are proposed.

REFERENCES

- Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.
- Duke Energy. 1999h. Letter describing changes to MLPPPP i.e., upgrade change to -----units 6 & 7, submitted to the CEC on September 7, 1999.
- GTW (Gas Turbine World). 1998. *Gas Turbine World 1998-1999 Performance Specs*, volume 18. December 1998.
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- Power (Power Magazine). 1994. "Operating and maintaining IPP/cogen facilities," *Power*, September 1994, p. 14.
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TRANSMISSION SYSTEM ENGINEERING

Testimony of Charles Vartanian and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the Energy Commission's decision. This final staff analysis indicates whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission.

The Duke Energy Moss Landing LLC proposes to connect their project, the Moss Landing Power Plant Project (MLPPP), to Pacific Gas & Electric Company's (PG&E) transmission system. The California Independent System Operator (Cal-ISO) is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Energy Commission will rely on the Cal-ISO's determinations to make its finding related to applicable reliability standards, the need for additional transmission facilities, and environmental review of the whole of the project. In this case, staff is primarily a facilitator, coordinating the Cal-ISO's process and results with the certification process and the Energy Commission decision. The Cal-ISO will provide testimony at the Energy Commission's hearings.

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, and §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction", formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction,

maintenance, operation or use of overhead electric lines and to the public in general.

- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 “Criteria for Transmission System Contingency Performance” which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).
- North American Electric Reliability Council (NERC) Planning Standards provides policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.
- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied to the assessment of the system reliability implications of the MLPPP. Also of major importance to the MLPPP, and other privately funded projects which may sell through the California Power Exchange (Cal-

PX) are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed the generating units net power output 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.
- PG&E Interconnection Handbook describes the technical requirements for generators connected to the PG&E electrical system. The PG&E Interconnection Handbook addresses PG&E standards related to design, construction, operation and maintenance which must be met by wholesale generators and/or loads.

PROJECT DESCRIPTION

Duke Energy (i.e., the applicant) is seeking to increase capacity at MLPPP by 1090 MW. 1060 MW is from two new 530 MW high efficiency combined cycle units, and 30 MW is from incremental capacity increases to existing units 6 and 7 (Duke Energy 1999a, AFC page 1-2, and, Duke Energy 1999i.). The MLPPP facility is located 12 miles northwest of Salinas CA, in Monterey County at the intersection of Highway 1 and Dolan Road east of the Moss Landing Community and near the Moss Landing Harbor. The 239 acre MLPPP site is an industrial complex consisting of 7 generating units, 10 exhaust stacks, 19 fuel oil storage tanks, 2 seawater inlet and outlet structures, various warehouse and office buildings directly adjacent to PG&E's Moss Landing Switchyard (MLSY). The MLSY includes 115 kilovolt (kV), 230 kV, and 500 kV systems. Each of these systems, in turn, contains transmission lines, towers, switches, bus bars, circuit breakers and transformers.

The applicant proposes to install two 530 MW (totaling 1060 MW) high efficiency combined cycle units in the location of existing fuel tanks 3, 4, and 10, install four 145 foot tall exhaust stacks, and remove eight 225-foot-tall existing exhaust stacks. Full-scale operation is currently scheduled to commence in October 2002. Moreover, the applicant proposes to upgrade existing MLPPP Units 6 and 7 by replacing the high-pressure rotor and increasing steam flow rate, resulting in an additional 15 MW per unit of generation capacity (totaling 30 MW). Unit 6 is currently scheduled to be operational in June 2003. Unit 7 is currently scheduled to be fully operational in December 2001.

The Cal-ISO has reviewed PG&E's Preliminary Facilities Study (PFS) and subsequent additional analysis for MLPPP. Cal-ISO's conclusive comments and preliminary interconnection approval were transmitted in letter (dated 02.10.00 and docketed on 02.17.00). The Cal-ISO concluded that the PFS, along with subsequent additional analysis, were adequate for the Cal-ISO to identify the facilities that will require reinforcement (or other mitigation measures) due to planning criteria violations triggered by MLPPP. Existing facilities with post-project loading criteria violations are listed in the Cal-ISO's letter (Cal-ISO 2000a, page1).

The Cal-ISO has also requested additional analysis be performed in the pending Detailed Facilities Study (DFS) for MLPPP. This is required so the Cal-ISO will have sufficient information with which to make a determination on final interconnection approval. The requested additional analysis items are listed in an attachment to the Cal-ISO's February 10th letter (Cal-ISO 2000a, Attachment A).

PG&E'S SWITCHYARD FOR MLPPP (MLSY)

The MLSY is located north of the main power plant structure. The switchyard consists of three different sections, including 115 kV, 230 kV and 500 kV buses. The power produced by MLPPP units 6 and 7 is connected to the MLSY's 500 kV system by existing short generation tie connections and step up transformers. From that point, power is directed to offsite substations (see the Existing Facilities and Related Systems Section for the specific details). The output from both 530-MW units will feed directly into the MLSY's 230 kV system (Duke Energy 1999a, AFC pages 8 -12).

TRANSMISSION LINE CHARACTERISTICS

Two 230 kV transmission lines will interconnect the generator step up transformers to the MLSY using overhead construction. Each of these generator tie lines will serve half of the new plant with each line terminating at an existing 230 kV breaker position at MLSY. The conductor size and type assumed by Duke Energy is 2156 Kcmil Aluminum Conductor Steel Reinforced, code 'bluebird'.

The applicant has identified planned adequate ampacity rating of at least 1,650 Amps in the AFC(Duke Energy, 1999a, AFC page 8-12). The final designed transmission circuit will be sized to 'bluebird' and/or to accommodate continuous full plant output, and line construction will meet or exceed GO-95 specifications, in accordance with the conditions of certification specified in TSE-1a and TSE-1d.

ALTERNATIVE TRANSMISSION LINE ROUTES

The MLPPP does not require any additional transmission line construction, except for short onsite segments necessary to convey power to the PG&E switchyards immediately adjacent to the MLPPP site (Duke Energy 1999a, AFC page 2-27). While the existing switchyards and power grid are adequately sized to be candidate facilities for interconnection, the MLPPP PFS does identify some switching station component replacement, and possible reconductoring or remedial action schemes, as required to accommodate the increased Project output. The MLPPP DFS will further develop the specific scope of facility upgrades required.

EXISTING FACILITIES AND RELATED SYSTEMS

The following electric facilities are located near the MLPPP site and transmission line routes. The MLSY is situated north of the main power plant structure and connected to several long-range transmission lines that extend offsite to various regional substations. The transmission lines are typically supported by 100-to-150 foot towers. At the receiving substations, the power is transformed (i.e., stepped down) to lower voltages (60 kV and less) for distribution to various communities and businesses. The transmission lines (Duke Energy 1999a, AFC pages 6.18-2 & 6.18-3) that exit MLSY include:

- Moss Landing-Los Banos 500-kV Line: This line serves the Los Banos substation, which is connected to the major 500 kV system and also serves San Joaquin Valley areas. The Los Banos substation is located in Merced County, about 9 miles west of the City of Los Banos, and about 51 miles southeast of MLPPP;
- Moss Landing-Metcalf 500-kV Line: This line serves the Metcalf substation, which serves the greater San Jose and Santa Clara valley areas. The Metcalf substation is located in Santa Clara County, near the town of Coyote, approximately 35 miles northeast of MLPPP;
- Metcalf-Moss Landing 230-kV Lines 1 and 2: These lines also serve the Metcalf substation;
- Moss Landing-Panoche 230-kV Lines 1 and 2: These lines serve the Panoche substation, which serves the greater San Joaquin Valley areas. One line is looped through the Coburn substation, near King City in the Salinas Valley. The Panoche substation is located in Fresno County, about 70 miles east of MLPPP;
- Moss Landing-Green Valley 115-kV Lines 1 and 2: These lines serve the Green Valley substation, which serves the greater Santa Cruz area. The Green Valley substation is located in Santa Cruz County, about 14 miles north of MLPPP;
- Moss Landing-Del Monte 115-kV Lines 1 and 2: These lines serve the Del Monte (and Castroville) substations, which serve the greater Monterey area. The Del Monte substation is located in Monterey County, about 24 miles south of MLPPP;
- Moss Landing-Salinas 115-kV Lines 1 and 2: These lines serve the Salinas (and Dolan Road) substations, which serve the greater Salinas area. The Salinas substation is located in Monterey County, in the City of Salinas, about 20 miles east of MLPPP;
- Moss Landing 115-kV Taps 1 and 2: These taps serve the greater Salinas (and area, via the Hollister, Prunedale, Salinas, and Soledad substations.

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 should not only identify impacts

but also ways negative impacts can be minimized or negated. Any new transmission facilities such as the power plant switchyard, the outlet line, and, or downstream facilities, required for connection to the grid are considered part of the project and are subject to the full AFC review process. The Cal-ISO has reviewed the PFS for the MLPPP. Based upon its review, the Cal-ISO stated that the MLPPP PFS is adequate to determine the facilities that will need to be reinforced in order for the MLPP Expansion Project to reliably interconnect to the ISO Controlled Grid and has granted preliminary interconnection approval (Cal-ISO 2000a. page 1). The Cal-ISO stated that before it can give its final interconnection approval for the MLPPP the applicant will need to complete some additional studies in the DFS (Cal-ISO 2000a. page 1).

The Cal-ISO through a lengthy and involved Stakeholder process determined that responsibility for congestion on transmission facilities caused by a new generator is most appropriately assigned to the new generator. The FERC rejected this Cal-ISO Tariff amendment and directed the Cal-ISO to reconvene a stakeholder process to develop a solution. Absent an approved CA-ISO Tariff amendment addressing policies for interconnection of new generation, the Cal-ISO is utilizing the policies and practices of the PTO's from which generators have requested service. In this case, the PTO is PG&E (Cal-ISO 2000a. Pages 1-2).

As an illustration of potential mitigation options available to a new generator, the previously filed and rejected Cal-ISO Tariff amendment identified six options. The six options are: 1) upgrading overloaded facilities or constructing new facilities; 2) remedial action schemes (RAS); 3) absorbing the incremental congestion costs created by their new generation; 4) paying others to curtail; 5) self-curtailment; or 6) choosing another location. Staff expects the project owner and PG&E to develop RAS, if necessary, to mitigate any congestion caused by the MLPPP. Any proposed RAS will be reviewed by the Cal-ISO and will require their concurrence prior to the Cal-ISO's issuance of their final interconnection approval.

The creation of suitable RAS or another non-transmission reinforcement congestion mitigation option will be included as a condition of certification for the project. The Cal-ISO will provide testimony on the PFS and will provide conclusions and findings in the Energy Commission's hearings. At this time staff does not expect the project will require any downstream facilities. Completion of the DFS and the subsequent issuance of the Cal-ISO's conclusions and findings regarding the study will assure conformance with NERC, WSCC and Cal-ISO reliability criteria.

Condition of certification **TSE-1e** is recommended to provide for Energy Commission review of the DFS, the Cal-ISO's DFS review, and the PG&E/applicant facility interconnection agreement.

SYSTEM RELIABILITY STUDY

A system reliability study determines whether the new project would cause thermal overload violations, voltage deviation violations (voltages too high or low), and/or electric system instability (excessive oscillations). In addition to the above analysis, studies are performed to verify that sufficient reactive power (see Definition of

Terms) is available. The reliability evaluation must be conducted for all credible “emergency” conditions. Emergency conditions could include the loss of a single or double circuit line, the loss of a transformer or generator, or a combined loss of these facilities. A PFS is conducted in advance of potential system changes, such as the addition of the MLPPP into the system, in order to identify any criteria violations and the mitigation measures available. The criteria used in this evaluation include the WSCC Planning Criteria, NERC Planning Standards and applicable Cal-ISO reliability criteria.

The applicant requested that PG&E perform a PFS for its proposed MLPPP in April 1999. The purpose of this PFS was to evaluate system reliability regarding whether the addition of the MLPPP expansion with a total maximum generation of 2,726 MW at 0.85 PF (3207 MVA) would cause thermal overloads, voltage violations and/or electric system instability. Further, it would verify the sufficiency of reactive power. The scope of this PFS included: a) an evaluation of the impact to the PG&E transmission system with the addition of the MLPPP; and b) an identification of the transmission upgrades and their associated costs to mitigate the overloaded facilities caused solely as a result of the addition of the MLPPP (Duke Energy. 1999a, AFC Appendix 6.18.2, page 1).

Following completion of the PFS and some additional supporting analysis, preliminary determination of compliance with applicable reliability criteria has been provided by the Cal-ISO (Cal-ISO 2000a. Page 1). A final determination of compliance with reliability planning standards, and approval of any specific mitigation measures identified, will be determined by the Cal-ISO based on PG&E’s DFS for MLPPP.

SCOPE OF RELIABILITY STUDIES

The PFS’s Study Assumptions and Estimated Work Scope included the following:

1. PFS’s Interconnection Assumptions (Duke Energy. 1999a, AFC Appendix 6.18.2, page 3):
 - The two generating MLPPP modules will have a maximum combined delivery of 1080 MW at 0.85 PF (1270 MVA) to the PG&E transmission grid;
 - The two generating MLPPP modules will be connected to the 230kV bus utilizing existing oil circuit breaker numbers 370 and 380 with rated continuous current of 2 kA and interrupting current of 63 kA. The applicant owns these breakers but they’re located in PG&E’s MLSY;
 - Both combined cycle generation modules will be connected to the 230 kV bus sometime during 2002. This project includes the demolition and removal of the existing generation Units 1 – 5 from the Moss Landing site;
 - The applicant will complete any reconductoring work on breaker structures and unit transformers;
 - The applicant will furnish and install all control and relay protection for the units and unit transformers.

2. Estimated Work Scope (Duke Energy. 1999a, AFC Appendix 6.18.2, pages 3 - 4): The scope of PG&E's job estimate (with intended accuracy of plus or minus 50%) includes determining the costs associated with the 7 items, which appear below:
 - Replacing the existing 1,200 A disconnect switches (i.e., numbers 373, 375, 377, 379, 383, 385, 387, and 389) with new 2000 A disconnects with type RG insulators;
 - Reconductoring high voltage connections from 230 kV busses to the breaker structures using bundled 1113 Kcmil AAL conductors and 3" SPS tubing where necessary;
 - Replacing the 115 kV circuit breaker 162 at Dolan Road substation due to the resulting overstress;
 - Providing any line protection changes in other substations connected to MLPPP's 230 kV bus as recommended by PG&E's System Protection;
 - Providing the labor associated with switching and clearances;
 - Providing labor to test the breakers for which the applicant will furnish the protection schemes; and,
 - Providing engineering and other related services.
3. Power Flow Base Case Assumptions and Modifications to PG&E's 2002 Base Case (Duke Energy. 1999a, AFC Appendix 6.18.2, pages 4 - 5):

A. Power Flow Assumptions:

PG&E staff conducted the MLPPP PFS power flow and generation sensitivity analysis (utilizing GE's PSLF power system analysis software) using PG&E's 2002 Heavy Summer Peak and 2002 Summer Off Peak base cases. The key assumptions for each of these base cases are included in the following table:

Transmission Line/Generators:	2002 Heavy Summer Pk (MW)	2002 Summer Off Pk (MW)
1. California-Oregon 500 kV	4800	3000
2. California-Oregon 115 kV	80	0
3. Midway-Vincent (South Tie)	Swing Bus	Swing Bus
4. Total Bay Area Load:	8740	6495
5. Total Bay Area (Generation)	4680	3416
6. Generating Units:	Generating Capacity (MW)	Generating Capacity (MW)
a. Pittsburg Units 1 – 7:	2050	1920
b. Contra Costa Units 6 & 7:	680	400
c. Moss Landing 6 & 7	1646	1400

B. Modifications to PG&E's 2002 Base Case:

- New line ratings were modeled for the Lakewood-Meadow Lane and Lakewood-Moraga Junction 115 kV lines;
- New line ratings were modeled for the Pittsburg-Tassajara, Pittsburg-San Ramon, and the Contra Costa-Newark #1 & #2 230 kV lines; and,

- Watsonville substation was modeled as being connected to the Moss Landing-Green Valley 115 kV #1 and #2 lines and removed from the Watsonville-Hollister 60 kV transmission line.

POWER FLOW STUDY RESULTS

The general criteria for identifying overloads uses simulation modeling under normal (i.e. all elements in service) and emergency (i.e. one or more system elements out of service) conditions. Normal overloads are identified as any transmission facility (i.e., transformer bank, transmission line) reaching 100% or greater with respect to its normal summer rating due to MLPPP expansion. Likewise, emergency overloads are identified as any transmission facility reaching 100% or greater of its summer emergency rating during a single line or transformer contingency due to MLPPP expansion.

The power flow studies conducted for the MLPPP PFS indicate that some emergency condition overloads were identified for the summer peak study and for the off peak study attributable to MLLP expansion. The specific overloaded facilities appear on Tables 2– 5 in the PFS (Section 8.3 pages 7-10). Subsequent studies prompted by input from the Cal-ISO resulted in a modified list of overloaded equipment identified in the Cal-ISO’s letter granting preliminary interconnection approval (Cal-ISO 2000a. Page 1). That information is reproduced below:

Transmission Line	Rating	% Rating Overload
Metcalf – Moss Landing 230 kV #1	911 A	117 %
Metcalf – Moss Landing 230 kV #2	911 A	117 %
Ravenswood – Ames 115 kV #1	522 A	104 %
Ravenswood – Ames 115 kV #2	522 A	104 %
Morgan Hill – Green Valley 115 kV #1	406 A	111 %
Monta Vista 230/115 kV Transformer Bank #3	144 MVA	105 %

The Cal-ISO notes that the overloads on the Ravenswood – Ames 115 kV may be pre-existing and expressed their opinion that these two particular overloads may not be the responsibility of MLPPP.

The MLPPP PFS cites line reconductoring or Remedial Action Scheme (RAS) as potential mitigation measures. The Applicant has indicated its preference for RAS as the mitigation measure (Duke Energy. 1999k, Attachment).

The February 1, 2000 study plan for the DFS calls for additional powerflow sensitivity cases based in-part on Cal-ISO comments on the PFS. The DFS powerflow cases will incorporate several assumption changes. Stated assumption changes for the DFS ‘sensitivity’ powerflow study include:

- Year 2002 Bay Area summer peak load increased to 9,315 MW from 8,740 MW.
- Watsonville Substation to be modeled on the 60 kV system vs. 115 kV system.

- New market generation assumed on-line includes Newark Energy Center (NEC) and Sutter projects.
- Market generation sensitivity cases with cumulative addition of three projects in the following order, LMEC, DEC, and MEC.

STABILITY STUDY RESULTS

The following outages and/or disturbances were modeled by simulating a three-phase fault at a substation bus and cleared after 6 cycles for 230 kV lines and 4 cycles for 500 kV lines.

1. Non-simultaneous loss of each of the 540 MW generating modules. The fault was simulated on the MLPPP 230 kV bus;
2. Moss Landing-Los Banos 500 kV line outage. The fault was simulated on the MLPPP 500 kV bus;
3. Metcalf-Moss Landing 500 kV line outage. The fault was simulated on the MLPPP 500 kV bus;
4. Moss Landing-Metcalf #1 230 kV line outage. The fault was simulated on the MLPPP 230 kV bus;
5. Moss Landing-Metcalf #1 and #2 230 kV double line outage. The fault was simulated on the MLPPP 230 kV bus;
6. Moss Landing-Green Valley #1 115 kV line outage. The fault was simulated on the MLPPP 115 kV bus;
7. Moss Landing-Green Valley #1 and #2 115 kV double line outage. The fault was simulated on the MLPPP 115 kV bus;

Preliminary stability studies performed for the PFS analyzed the 7 disturbances shown above in conjunction with addition of MLPPP. Results of the PFS stability studies show that the transmission network remained stable.

Following completion of the PFS, additional stability cases were identified for analysis in the DFS study plan. The DFS stability cases are:

1. Load rejection of Moss Landing Unit 6.
2. Load rejection of both Moss Landing Units 6 & 7.
3. Three phase fault with normal clearing on the Moss Landing 500 kV bus followed by the loss of the Moss Landing – Metcalf 500 kV circuit.
4. Three phase fault with normal clearing on the Moss Landing 500 kV bus followed by the loss of the Moss Landing – Los Banos 500 kV circuit.
5. Three phase fault with on the Moss Landing 500 kV bus followed by the loss of the Moss Landing 500/230 kV transformer.
6. Three phase fault with normal clearing on the Moss Landing 230 kV bus followed by the loss of one of the proposed 540 MW generating modules.
7. Three phase fault with normal clearing on the Moss Landing 230 kV bus followed by the loss of the Metcalf – Moss Landing #1 230 kV circuit.
8. Three phase fault with normal clearing on the Moss Landing 230 kV bus followed by the loss of the Metcalf – Moss Landing #2 230 kV circuit.
9. Three phase fault with normal clearing on the Moss Landing 115 kV bus followed by the loss of the Moss Landing – Green Valley #1 115 kV circuit.

10. Three phase fault with normal clearing on the Moss Landing 230 kV bus followed by the loss of the Metcalf – Moss Landing #2 230 kV circuit.
11. Single line to ground fault on Moss Landing 230 kV bus.
12. Single line to ground fault on Moss Landing 115 kV bus.

In any case, the applicant points out that studies are still ongoing and should future stability studies show indication of instability or unacceptable operating conditions then other alternatives such as RAS or generation dropping would be considered to mitigate the stability issue.

SHORT CIRCUIT STUDY RESULTS

Short circuit analyses are conducted to assure that existing and proposed breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The addition of a generation unit to the grid can significantly increase the level of current that flows through circuit breakers. The acceptability of breaker ratings can also be determined during the compliance phase; it need not be done during the AFC process.

The DFS will include short circuit studies to determine the fault duties on the existing PG&E facilities. Any equipment overstressed solely from the addition of MLPPP will be identified (PG&E 2000a. page 7). Condition of certification TSE-1b is recommended to ensure that breaker ratings will be adequate to interrupt post-project fault current.

CAL-ISO REVIEW

The Cal-ISO has reviewed MLPPP's PFS, and with additional input from the applicant, has concluded that it is adequate for the Cal-ISO to grant preliminary interconnection approval. Based on the PFS, there are a number of facilities that may need to be reinforced in order for MLPPP to be interconnected to Cal-ISO controlled grid. The identified facilities are needed to relieve congestion and maintain system reliability. The criteria violations that will be mitigated by those facilities have been identified in the Cal-ISO's preliminary approval letter. The criteria violations are system overloads which occur after MLPPP is connected to the system under emergency (N-1) conditions. The applicant has identified RAS, instead of facility upgrades, as their preferred mitigation measure for alleviating project triggered overloads. Use of RAS in place of facility upgrades for Cal-ISO operated grid assets requires approval by the Cal-ISO. A determination from the Cal-ISO on acceptability of any proposed RAS will follow their review of the DFS.

The Cal-ISO indicated that further analysis should be performed to determine power flow and stability impacts with 'sensitivity' assumptions. New assumptions to be tested include increased Bay Area load, and coincident operation of other potential future generating plants. PG&E will have to perform additional work in the DFS prior to the Cal-ISO granting final interconnection approval to MLPPP. However, it is likely that no downstream facilities not already identified would be required as a result of these additional studies.

ALTERNATIVES

The MLPPP does not require any additional transmission line construction, except for short onsite segments necessary to convey power to the PG&E switchyards immediately adjacent to the MLPPP site. The existing switchyards and power grid are adequately sized and maintained for the additional power generated by the MLPPP (Duke Energy 1999a, AFC page 2-27).

CUMULATIVE IMPACTS

The only projects with preceding AFCs or licenses likely to impact the MLPPP are MEC, DEC, and LMEC (with any impacts from DEC and LMEC being minor). Other projects which have filed AFC's or have licenses including Elk Hills, La Paloma, Pastoria, Midway-Sunset, and Sunrise are electrically remote and will not impact the MLPPP.

The DFS will include sensitivity powerflow cases which will illustrate the impact of MLPPP with addition of the NEC, MEC, DEC and LMEC projects in the following combinations:

1. MLPPP without NEC.
2. MLPPP with NEC and LMEC.
3. MLPPP with NEC, LMEC, and DEC.
4. MLPPP with NEC, LMEC, DEC and MEC.

Results of this analysis will be provided to Cal-ISO for review and consideration prior to the Cal-ISO granting final interconnection approval.

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 MLSY) 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 operation¹ 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

¹ As an example, the PTO has control over the generating unit breakers so that only when the PTO's line crews have completed maintenance, for instance, and are clear of the line or other facilities, could the unit reclose the system.

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.” Condition of certification TSE-1c requires compliance with this rule.

The ability of the above LORS to reasonably assure safe and reliable conditions, in the event of facility closure, was evaluated for three scenarios:

PLANNED CLOSURE

This type of closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances, the requirement for the owner to provide a closure plan 12 months prior to closure, in conjunction with applicable LORS, is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the PTO² 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.

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishment of an on-site contingency plan (see General Conditions Including Compliance Monitoring and Closure Plan).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan, that is in place and approved by the CPM prior to the beginning of commercial operation of the facilities, will be developed to assure safety and reliability (see General Conditions Including Compliance Monitoring and Closure Plan).

² The PTO, in this instance, is PG&E, e.g., the system owner to which the project is interconnected.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has reviewed the PFS and the Cal-ISO has provided comments on its review of the MLPPP PFS. Based on the PFS, and subsequent related analysis per comment by the Cal-ISO (Cal-ISO 1999a.), preliminary interconnection approval was granted (Cal-ISO 2000a. page 1). The Cal-ISO further directs the applicant to conduct additional transmission studies on MLPPP before final interconnection approval can be granted (Cal-ISO 2000a, page 1). Commission Staff concurs with the Cal-ISO's assessment and this information will be provided for Commission review per Condition of Certification **TSE-1e**. Once final interconnection approval is granted by the Cal-ISO, MLPPP will be in compliance with the appropriate reliability criteria, assuming implementation of the conditions of certification below.

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 substation configurations is acceptable.

- a) The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95, Title 8, CCR, section 27000 et seq., "High Voltage Electric Safety Orders", National Electric Code (NEC), and Industry Standards.
- b) Termination facilities shall comply with applicable Cal-ISO and PG&E interconnection standards (PG&E Interconnection Handbook and CPUC Rule 21).
- c) 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.
- d) The project conductors shall be sized to accommodate the full output from both 530 MW units.
- e) The project owner shall provide a Detailed Facility Study (DFS) including a description of Remedial Action Scheme (RAS) sequencing and timing, if applicable, and an executed Facility Interconnection Agreement for the project transmission interconnection with PG&E. The DFS and Interconnection Agreement shall be coordinated with the Cal-ISO and shall comply with Cal-ISO comments detailed in its February 10, 2000 letter to the project owner, or with Cal-ISO's comments as modified by mutual agreement between Duke Energy and the Cal-ISO.

Verification: At least 60 days prior to start of construction of transmission facilities, the project owner shall submit for approval to the CPM:

- 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”³ 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, section 27000 et seq., “High Voltage Electric Safety Orders”, NEC, and Industry Standard.
- 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 **TSE-1** a) through e) above. The Detailed Facilities Study and executed interconnection agreement shall concurrently be provided. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CPM approval.

TSE-2 The project owner shall inform the CPM of any impending changes, which may not conform to the requirements **TSE-1** a) through e), and have not received CPM approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction, involving changed equipment or substation configurations, shall not begin without prior written approval of the changes by the CPM.

Verification: At least 60 days prior to construction of transmission facilities, the project owner shall inform the CPM of any impending changes which may not conform to requirements of TSE-1 and request approval to implement such changes.

TSE-3 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM approved changes thereto, to ensure conformance with CPUC GO-95, Title 8, CCR, section 27000 et seq., “High Voltage Electric Safety Orders”, NEC, Cal ISO Standards, the PG&E Interconnection Handbook, and CPUC Rule No. 21 and these conditions. In case of non-conformance, the project owner shall inform the CPM in writing, within 10 days, of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM:

³ Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

- a) “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 GO-95, Title 8, CCR, section 27000 et seq., “High Voltage Electric Safety Orders”, NEC, Cal ISO Standards, CPUC Rule No. 21, the PG&E Interconnection Handbook, and these conditions shall be concurrently provided.
- b) 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. “As built” drawings of the mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the “Compliance Monitoring Plan”.
- c) 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 System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol, posted April 1998, Amendments 1, 4, 5, 6, and 7 Incorporated.
- Cal-ISO (California System Operator). 1998b. Cal-ISO Dispatch Protocol, posted April 1998.
- Cal-ISO (California System Operator). 1999a. Preliminary comments on the PG&E PFS for MLPPP dated November 3, 1999 and docketed on November 22, 1999.
- Cal-ISO (California System Operator). 2000a. Cal-ISO preliminary interconnection approval for MLPPP dated February 10, 2000 and docketed on February 17, 2000.
- Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the Energy Commission, May 7, 1999.
- Duke Energy. 1999i. Duke Energy supplemental to the AFC detailing upgrade changes to Units 6 & 7. Submitted to the Energy Commission on 11/22/99.
- Duke Energy. 1999k. Duke Energy supplemental filing regarding electric transmission system overload/Moss Landing Power Plant. Submitted to the Energy Commission on 11/04/99.
- Duke Energy 2000a. PG&E's Detailed Facilities Study, Study Plan [for] Duke Energy North America, Moss Landing Power Plant Project dated 2/1/2000. Submitted to the Energy Commission on February 2, 2000.
- NERC (North American Electric Council). 1998. NERC Planning Standards, September 1997.
- WSCC (Western Systems Coordinating Council). 1997. Reliability Criteria, August 1998.

DEFINITION OF TERMS

ACSR	Aluminum cable steel reinforced. A composite conductor made up of a steel core surrounded by aluminum wire.
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere	The unit of current flowing in a conductor.
Bundled	Two conductors, 18 inches apart.
Bus	Conductors that serve as a common connection for two or more circuits.
Conductor	The part of the transmission line (the wire) which carries the current.
Congestion Management	Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports), will not violate criteria.
Emergency Overload	See Single Contingency. This is also called an L-1.
Kcmil or kcm	Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.
Kilovolt (kV)	A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.
L-1	The outage of a single line.
Megavar	One megavolt ampere reactive.
Megavars	Megavolt-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, divided by 1000.
Megawatt (MW)	A unit of power equivalent to 1,341 horsepower.

Normal Operation	When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.
N-1 Condition	See Single Contingency. Also called an L-1.
Outlet	Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.
Power Flow Analysis	A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.
Reactive Power	Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.
Remedial Action Scheme (RAS)	A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.
SF6	Sulfur hexafluoride is an insulating medium.
Single Contingency	Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.
Solid dielectric cable	Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.
Thermal rating	See ampacity.
TSE	Transmission System Engineering.
Undercrossing	A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.
Underbuild	A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

COMPLIANCE MONITORING PLAN INCLUDING GENERAL CONDITIONS AND CLOSURE PLAN

Testimony of Jeri Zene Scott

INTRODUCTION

The Compliance Monitoring Plan (Compliance Plan) has been established as required by Public Resources Code section 25532. The plan provides a means for ensuring that the Moss Landing Power Plant is constructed and operated in compliance 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:

1. 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 requirement 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.
2. Specific conditions of certification:

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.

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. Technical staff from both the Energy Commission and the project owner will meet to review the status of all pre-construction or pre-operation Energy Commission's conditions of certification. They will determine whether all requirements 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 may need to be publicly noticed unless they are confined to administrative issues and process.

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 be, upon request to the project owner, 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 audit of project records; and/or
4. Energy Commission staff inspection 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
Moss Landing Power Plant Project (99-AFC-4C)
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 compliance reports.

COMPLIANCE MATRIX

The project owner to the CPM along with each monthly and annual compliance report shall submit a compliance matrix. 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
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.

START OF CONSTRUCTION

Construction shall not commence until this matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing the start of 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 extends beyond the day anticipated for the start of construction. It is important that the project owner understand that pre-construction activities are performed at their own risk. Failure to allow appropriate lead-time may cause delays in start of construction.

MONTHLY COMPLIANCE REPORT

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date that the project was approved, unless the 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 Monthly Compliance Reports 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 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, which follows:

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 will 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

This planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

UNEXPECTED TEMPORARY CLOSURE

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

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes 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 that a planned facility closure does not create adverse impacts, a closure process, that will provide for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 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:

1. 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.

2. 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;
3. Identify all facilities or equipment that will a) be immediately removed from the site after closure (e.g. hazardous materials); b) temporarily remain on the site after closure (e.g., until the item is sold or scrapped); and c) permanently remain on site after closure. The plan must explain both why the item cannot be removed and why it does not present a risk of harm to the environment and the public health and safety to remain *insitus* for an indefinite period.
4. 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 or 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 than 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.

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 circumstances and expected duration of the closure.

If it is determined that a temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the determination. The CPM and the project owner may agree to a period of time other than 90 days.

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.

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:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and,
4. 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.

Within 30 days after receipt of a written complaint or request for investigation, the Chairperson or, if one is assigned, the Committee 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 _____

<i>EVENT DESCRIPTION</i>	<i>DATE ASSIGNED</i>
Date of Certification	
Start of Construction	
Completion of Construction	
Start of Operation (1 st 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	

MOSS LANDING PREPARATION TEAM

Executive Summary.....	Paul Richins
Introduction.....	Paul Richins
Project Description.....	Paul Richins
Air Quality.....	Matthew Layton
Public Health.....	Obed Odoemelum
Worker Safety and Fire Protection.....	Kathi Hann
Transmission Line Safety and Nuisance.....	Obed Odoemelum
Hazardous Materials Management	Rick Tyler
Waste Management	Mike Ringer
Land Use.....	Eric Knight
Traffic and Transportation	Steve Brown
Noise.....	Steve Baker
Visual Resources.....	David Flores
Cultural Resources	Dorothy Torres & Deborah K. McLean
Socioeconomic Resources	Amanda Stennick
Biological Resources.....	Dick Anderson
Soil and Water Resources.....	Joe O'Hagan & Lorraine White
Geology and Paleontology	Robert Anderson
Facility Design.....	M. Kisabuli
Power Plant Reliability	Steve Baker
Power Plant Efficiency.....	Steve Baker
Transmission System Engineering	Al McCuen & Charles Vartanian
Alternatives	Lisa DeCarlo & Paul Richins

Compliance Monitoring and Facility ClosureJeri Zene Scott

Project Secretary.....Luz Manriquez and Sharee Knight

WITNESS QUALIFICATIONS AND DECLARATIONS