Preliminary Staff Assessment

WALNUT ENERGY CENTER

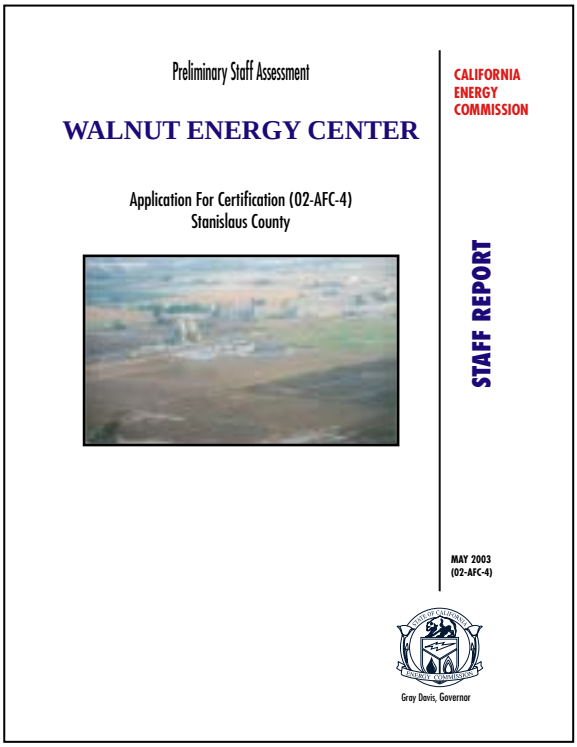
Application For Certification (02-AFC-4)
Stanislaus County

CALIFORNIA
ENERGY
COMMISSION

STAFF REPORT

MAY 2003
(02-AFC-4)

Gray Davis, Governor



CALIFORNIA ENERGY COMMISSION

SITING OFFICE

Bob Eller
Project Manager

Roger E. Johnson
Office Manager

SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION

Terrence O'Brien
Deputy Director

EXECUTIVE SUMMARY

INTRODUCTION

This Preliminary Staff Assessment (PSA) contains the California Energy Commission (Energy Commission) staff's independent analysis and preliminary recommendation on the Walnut Energy Center (WEC or project). The WEC and related facilities, such as the natural gas line, reclaimed and potable water supply lines, are under the Energy Commission's jurisdiction. When issuing a license, the Energy Commission acts as lead state agency under the California Environmental Quality Act, and its process is functionally equivalent to the preparation of an environmental impact report. Sometime after a 30-day public comment period on the PSA, staff will issue its testimony in the form of the Final Staff Assessment (FSA).

The Energy Commission staff has the responsibility to complete an independent assessment of the project's potential effects on the environment, the public's health and safety, and whether the project conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate potential significant adverse environmental effects and conditions for construction, operation and eventual closure of the project, if approved by the Energy Commission.

This PSA is not the decision document for these proceedings nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local/state/federal legal requirements. The FSA will serve as staff's testimony in evidentiary hearings to be held by the Committee of two Commissioners who are hearing this case. The Committee will hold evidentiary hearings and will consider the recommendations presented by staff, the applicant, all parties, government agencies, and the public prior to proposing its decision. The Energy Commission will make the final decision, including findings, after the Committee's publication of its proposed decision.

PROJECT LOCATION AND DESCRIPTION

On November 19, 2002, the Turlock Irrigation District (TID) filed an Application for Certification (AFC), for its proposed Walnut Energy Center (WEC) project with the California Energy Commission seeking approval to construct and operate a 250 megawatt (MW) natural gas-fired, combined-cycle electric generating facility. The plant would be owned and operated by TID. The Energy Commission determined the application to be data adequate on December 18, 2002. This determination initiated staff's independent analysis of the proposed project.

The WEC would be located in an industrially zoned area, currently used for agricultural production, about four miles west of the downtown portion of the City of Turlock, in Stanislaus County. The project site is located southeast of the intersection of West Main Street and South Washington Road. Access to the site will be via a new 1,900-foot road built off South Washington Road through the west side of the project parcel. **PROJECT DESCRIPTION Figure 1** shows the regional setting and **PROJECT DESCRIPTION Figure 2** provides the local setting for the proposed project.

The WEC would consist of two combustion turbine generators (CTGs) equipped with dry, low oxides of nitrogen (NO_x) combustors; two heat recovery steam generators (HRSGs); one condensing steam turbine generator (STG); a deaerating surface condenser; a five-cell mechanical-draft cooling tower; and associated support equipment providing a total nominal generating capacity of 250 MW (at average annual ambient conditions). The combustion turbines would be General Electric Frame 7EA units. The project will not include steam power augmentation to the CTGs, duct firing of the HRSGs, an auxiliary boiler, or a standby generator.

To control emissions of air pollutants, the WEC will utilize a control system designed to meet the proposed air emission limits. NO_x emissions from the WEC will be controlled to 2.0 parts per million by volume, dry basis, corrected to 15 percent oxygen (ppmc), by a combination of low NO_x combustors in the CTGs and selective catalytic reduction (SCR) systems in the HRSGs. An oxidation (CO) catalyst will be installed in the HRSGs to limit stack CO emissions to 4.0 ppm.

The WEC project would use up to 1,800 acre feet per year (afy) of reycled water provided by the City of Turlock's Waste Water Treatment Plant (WWTP) for cooling tower make-up. Recycled water for WEC will be produced by new treatment facilities, located in Turlock's existing WWTP.

The recycled water will be delivered to WEC through a new 12- to 24-inch pipeline, approximately 1.6 miles in length. The recycled water pipeline will be routed from the boundary of the Turlock WWTP on South Kilroy Road and run generally west to WEC (see **PROJECT DESCRIPTION Figure 2**).

A zero liquid discharge (ZLD) system will be used to recycle cooling tower blowdown onsite. A portion of the distillate generated from the ZLD process will be further treated by offsite regenerated mixed bed demineralizers and used as steam cycle make-up water. Distillate from the ZLD treatment system will be used to provide all of the steam cycle makeup water for WEC.

The WEC facility will be connected to TID's transmission system by looping both a 69- and 115-kV line into the WEC. At the 69-kV level, this will be accomplished by intercepting the existing 69-kV transmission line, located immediately south of the proposed site, and installing a double-circuit pole line into the WEC 69-kV switchyard. At the 115-kV level, this will be accomplished by intercepting one of two existing 115-kV transmission lines that run along the west side of South Washington Road and installing a double-circuit pole line into the WEC 115-kV switchyard.

A more complete description of the project is contained in the **PROJECT DESCRIPTION** section of this PSA.

PUBLIC AND AGENCY COORDINATION

The Energy Commission's WEC Committee conducted an Informational Hearing and Site Visit on January 24, 2003. This hearing provided a forum for the public to learn about the project, the Energy Commission's process, and to raise their questions and concerns about the proposed power plant.

When the AFC was filed, staff mailed a notice to all property owners adjacent to the proposed project informing of the proposed facility, the Energy Commission's review process, and how they could participate.

The Public Advisor's Office (PAO) sent the application to the Turlock Library and prepared a library and neighborhood poster announcing the project and displaying key contact information. Along with this application, the PAO sent 25 copies of a one-page project description with detailed information about the proposed project. The PAO also sent 1,000 bilingual (English and Spanish) newspaper inserts announcing the time, date and location of the Informational Hearing and Site Visit to the Turlock Journal.

Staff has also coordinated their review of the WEC with relevant local, state and federal agencies, such as the City of Turlock, Stanislaus County, California Independent System Operator, the San Joaquin Valley Air Pollution Control District, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the California Department of Fish and Game. This PSA provides agencies and the public the opportunity to review the Energy Commission staff's analysis of the proposed project.

Written comments on this PSA will be taken into consideration by the staff in preparing the Final Staff Assessment (FSA).

ENVIRONMENTAL JUSTICE

EPA guidelines on environmental justice state that if 50 percent of the population affected by a project has minority or low-income status, it must be determined if these populations are exposed to disproportionately high and adverse human health or environmental impacts.

In the Socioeconomics section of this report, staff presents the results of their "environmental justice screening analysis." The purpose of this analysis is to determine whether or not a low-income or minority population exists within the potential affected area of the proposed site.

Energy Commission staff have reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed WEC. However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters of minority population. Staff considers these pockets to require an environmental justice analysis.

When a minority /or low-income population is identified, staff in the technical areas of air quality, public health, hazardous materials, noise, water, waste, traffic and transportation, visual resources, land use, socioeconomics, and transmission line safety and nuisance must consider possible impacts on the minority/low-income population as part of their analysis. This environmental justice analysis consists of identification of significant impacts (if any), identification of mitigation, and determination of whether there is a disproportionate impact if an unmitigated significant impact has been identified.

Based on its preliminary analysis, staff has not identified any significant unmitigated impacts for the technical areas listed above, if staff's proposed mitigated measures are implemented.

STAFF'S ASSESSMENT

Each technical area section of the PSA contains a discussion of impacts, staff's preliminary conclusions and recommendations, and, where appropriate, mitigation measures and conditions of certification. The PSA includes staff's assessments of:

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

OVERVIEW OF STAFF'S CONCLUSIONS

Staff's preliminary analysis indicates that, with the exception of Biological Resources the project's environmental impacts can be mitigated to levels of less than significant, and that the project can be made to conform with all applicable LORS.

Staff is currently awaiting the results of the applicant's Spring 2003 surveys in order to determine the potential impacts of the project to Biological Resources. In Cultural Resources, staff has identified the need for additional information regarding several properties in the project area. Finally, staff will need to complete the review of additional information provided by the applicant regarding the potential impacts of anhydrous ammonia use. Staff will present a complete analysis of these technical areas, and recommendations, in the Final Staff Assessment.

Below is a table summarizing the potential environmental impacts and LORS compliance for each technical area.

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INTRODUCTION

Bob Eller

PURPOSE OF THIS REPORT

The Preliminary Staff Assessment (PSA) presents the California Energy Commission (Energy Commission) staff's independent analysis of the Turlock Irrigation District's Application for Certification (AFC) for the Walnut Energy Center (WEC) project. This PSA is a staff document. It is neither a Committee document, nor a draft decision. The PSA describes:

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

The analyses contained in this PSA are based upon information from: 1) the AFC; 2) subsequent submittals; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications; and 6) independent field studies and research. The analyses for most technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of "verification." The verification is not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements.

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code section 25500 et seq. and Title 20, California Code of Regulation section 1701 et seq., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).

ORGANIZATION OF THE STAFF ASSESSMENT

The PSA contains an Executive Summary, Introduction, Project Description, and Project Alternatives. The environmental, engineering, and public health and safety analysis of the proposed project is contained in a discussion of 19 technical areas. Each technical area is addressed in a separate chapter. They include the following: air quality, public health, worker safety and fire protection, transmission line safety, hazardous material management, waste management, land use, traffic and transportation, noise, visual resources, cultural resources, socioeconomics, biological resources, soil and water resources, geological and paleontological 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, and a list of staff that assisted in preparing this report.

Each of the 19 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).

ENERGY COMMISSION SITING PROCESS

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

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

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, §

1743(b)). Staff is required to coordinate with other agencies to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, § 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act. A Environmental Impact Report (EIR) is not required because the Energy Commission's site certification program has been certified by the Resources Agency (Pub. Resources Code, §21080.5 and Cal. Code Regs., tit. 14, §15251 (k)). The Energy Commission acts in the role of the CEQA lead agency and is subject to all other applicable portions of CEQA.

Staff typically prepares both a preliminary and final staff assessment. The Preliminary Staff Assessment (PSA) presents for the applicant, intervenors, agencies, other interested parties and members of the public, the staff's preliminary analysis, conclusions, and recommendations.

Staff uses the PSA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the PSA and the Final Staff Assessment (FSA), staff will conduct one or more workshops to discuss their findings, proposed mitigation, and proposed compliance monitoring requirements. Based on the workshops and written comments, staff will refine their analysis, correct errors, and finalize conditions of certification to reflect areas where staff has reached agreement with the parties. This refined analysis, along with responses to written comments on the PSA, will be published in the FSA. The FSA serves as staff's testimony on a proposal.

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

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is circulated in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD will be circulated for a comment period to be determined by the Committee. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any party may request that the Energy Commission reconsider its decision.

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The

Compliance Monitoring Plan and General Conditions will be presented in the PMPD. Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. Staff's proposed description of the contents of the Compliance Monitoring Plan and proposed General Conditions are included in the **GENERAL CONDITIONS** section of this PSA.

Agency Coordination

As noted above, the Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500). However, the Commission typically seeks comments from and works closely with other regulatory agencies that administer LORS that may be applicable to proposed projects. These agencies include the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Department of Fish and Game, and the California Air Resources Board.

PROJECT DESCRIPTION

Bob Eller

INTRODUCTION

On November 19, 2002, the Turlock Irrigation District (TID) filed an Application for Certification (AFC), for its proposed Walnut Energy Center (WEC) project with the California Energy Commission seeking approval to construct and operate a 250 megawatt (MW) natural gas-fired, combined-cycle electric generating facility. The plant will be owned and operated by TID. The Energy Commission determined the application to be data adequate on February 6, 2002. This determination initiated staff's independent analysis of the proposed project.

The WEC and related facilities, such as natural gas pipelines and waste water pipelines, are under the Energy Commission's jurisdiction. When issuing a license, the Energy Commission acts as lead state agency under the California Environmental Quality Act (CEQA), and its process is certified by the State Resources Agency as a separate program that satisfies the core CEQA requirements.

WALNUT ENERGY CENTER

LOCATION

The WEC would be located in an industrially zoned area, currently used for agricultural production, about four miles west of the downtown portion of the City of Turlock, in Stanislaus County. The project site is located southeast of the intersection of West Main Street and South Washington Road. Access to the site will be via a new 1,900-foot road built off South Washington Road through the west side of the project parcel. **PROJECT DESCRIPTION Figure 1** shows the regional setting and **PROJECT DESCRIPTION Figure 2** provides the local setting for the proposed project.

PROJECT EQUIPMENT AND LINEAR FACILITIES

The WEC will consist of two combustion turbine generators (CTGs) equipped with dry, low oxides of nitrogen (NO_x) combustors; two heat recovery steam generators (HRSGs); one condensing steam turbine generator (STG); a deaerating surface condenser; a five-cell mechanical-draft cooling tower; and associated support equipment providing a total nominal generating capacity of 250 MW (at average annual ambient conditions). The combustion turbines will be General Electric Frame 7EA units. The project will not include steam power augmentation to the CTGs, duct firing of the HRSGs, an auxiliary boiler, or a standby generator.

Each CTG will generate approximately 84 MW at base load under average ambient conditions. The CTG exhaust gases will be used to generate steam in the HRSGs. The HRSGs will be a reheat design without duct firing. Steam from the HRSGs will be admitted to a condensing STG. Approximately 100 MW will be produced by the steam turbine when the CTGs are operating at base load at average ambient conditions. The project is expected to have an overall annual availability of 92 to 98 percent.

PROJECT DESCRIPTION FIGURE 1

PROJECT DESCRIPTION FIGURE 2

Associated equipment includes an emission control system designed to meet the proposed air emission limits. NO_x emissions from the WEC will be controlled to 2.0 parts per million by volume, dry basis, corrected to 15 percent oxygen (ppmc), by a combination of low NO_x combustors in the CTGs and selective catalytic reduction (SCR) systems in the HRSGs. An oxidation (CO) catalyst will be installed in the HRSGs to limit stack CO emissions to 4.0 ppm.

Natural Gas Facilities

The WEC will be designed to burn natural gas only. Natural gas will be delivered to the site via a new 3.6-mile pipeline. This pipeline will extend from its interconnection to PG&E's Line 215 at West Bradbury Road, north approximately 2.8 miles along Commons Road until it reaches the railroad tracks, where it will turn east to the WEC site as shown on **PROJECT DESCRIPTION Figure 2**.

The WEC's maximum natural gas requirement natural gas requirement, during low ambient temperature operation, is approximately 2,095 MMBtu per hour, higher heating value (HHV).

Water Supply and Waste Water Treatment

The WEC project would use up to 1,800 acre feet per year (afy) of reycled water provided by the City of Turlock's Waste Water Treatment Plant (WWTP) for cooling tower make-up. Recycled water for WEC will be produced by new treatment facilities, located in Turlock's existing WWTP.
The recycled water will be delivered to WEC through a new 12- to 24-inch pipeline, approximately 1.6 miles in length. The recycled water pipeline will be routed from the boundary of the Turlock WWTP on South Kilroy Road and run generally west to WEC (see **PROJECT DESCRIPTION Figure 2**).
A zero liquid discharge (ZLD) system will be used to recycle cooling tower blowdown onsite. A portion of the distillate generated from the ZLD process will be further treated by offsite regenerated mixed bed demineralizers and used as steam cycle make-up water. Distillate from the ZLD treatment system will be used to provide all of the steam cycle makeup water for WEC.

The Regional Water Quality Control Board (RWQCB) has mandated that the City's water treatment facilities be operational by May 2006. Since the WEC project is currently scheduled to commence operations in the fourth quarter of 2005, TID proposes to use potable water from the City of Turlock to meet WEC's water demands until the City's recycled water is available. A new 8- to 12-inch pipeline, approximately 0.9-mile in length, will be constructed to deliver potable water to WEC from an existing main located in South Tegner Road, east of the WEC (see **PROJECT DESCRIPTION Figure 2**). The connection to the City of Turlock's existing line will be near the intersection of South Tegner Road and Ruble Road, and the pipeline will be installed in the Ruble Road right-of-way and proceed west to the plant site. Once recycled water is available, potable water for drinking, safety showers, fire protection water, service water, and sanitary uses will continue to be served from the potable water system. Sanitary wastewater will be disposed to an onsite septic system and leach field.
A more detailed description of the water supply system, treatment, and permits is provided in **Soil and Water Resources** section of this staff assessment.

Electric Transmission

The bulk of the electric power produced by the facility will be transmitted to the TID grid. A small amount of electric power will be used onsite to power auxiliaries such as pumps and fans, control systems, and general facility loads including lighting, heating, and air conditioning. Some will also be converted from alternating current (AC) to direct current (DC), which is used as backup power for control systems and other uses.

The WEC facility will be connected to TID's transmission system by looping both a 69- and 115-kV line into the WEC. At the 69-kV level, this will be accomplished by intercepting the existing 69-kV transmission line, located immediately south of the proposed site, and installing a double-circuit pole line into the WEC 69-kV switchyard. At the 115-kV level, this will be accomplished by intercepting one of two existing 115-kV transmission lines that run along the west side of South Washington Road and installing a double-circuit pole line into the WEC 115-kV switchyard. A detailed discussion of the transmission system is provided in **Transmission System Engineering** section of this staff assessment.

PROJECT CONSTRUCTION

Construction of the WEC would take place over approximately 24 months, from the first quarter of 2004 to the fourth quarter of 2005. Plant testing is expected to commence in the fourth quarter of 2005, with commercial operation expected in the first quarter of 2006.

FACILITY CLOSURE

The WEC will be designed for an operating life of 30 years. 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 setting for this project does not appear 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 at the time of closure. LORS pertaining to facility closure are identified in the technical sections of this assessment. Facility closure will be consistent with laws, ordinances, regulations and standards in effect at the time of closure.

REFERENCES

Turlock Irrigation District, Turlock, California (TID) 2002a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 19, 2002.

ENVIRONMENTAL ASSESSMENT

AIR QUALITY

William Walters and Lisa Blewitt

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the proposed Walnut Energy Center (WEC) by the Turlock Irrigation District (TID or applicant), which will be located in the City of Turlock, Stanislaus County.

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

- whether the WEC is likely to conform with applicable federal, state and San Joaquin Valley Air Pollution Control District air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1744 (b);
- whether the WEC is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and
- whether the mitigation proposed for the WEC is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act, as codified in 40 CFR 52.21, there are two major components of air pollution control requirements for stationary sources, nonattainment New Source Review (NSR) and Prevention of Significant Deterioration (PSD). Nonattainment NSR is a permitting process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a permitting process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR analysis has been delegated by the U.S. Environmental Protection Agency (U.S. EPA) to the San Joaquin Valley Air Pollution Control District (SJVAPCD, or District). The U.S. EPA determines the conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceed 250 tons per year for any pollutant, or any new facility or stationary source category that is listed in 40 CFR Part 52.21(b)(1)(i)(a), and that emits 100 tons or more per year of any criteria pollutant. A major modification at an existing major source that results in an emission increase of 100 ton per year for carbon monoxide (CO), 40 tons per year for oxides of nitrogen (NO_x), sulfur dioxide (SO_2) or volatile organic compounds (VOC), or 15 tons per year for particulate matter less than 10 microns in diameter (PM_{10}) will also be subject to PSD review. The entire program, including both nonattainment NSR and PSD reviews, is referred to as the federal NSR program. The WEC will be located adjacent to the existing Walnut Power Plant (WPP). Since the existing WPP is a minor

source and the increase in emissions from the new WEC plant is not a major source by itself, PSD does not apply to the WEC project.

Title V of the federal Clean Air Act requires states to implement and administer an operating permit program to ensure that large sources operate in compliance with the requirements included in 40 CFR Part 70. A Title V permit contains all of the requirements specified in different air quality regulations that affect an individual project. The WEC will require a Title V permit.

The WEC is also subject to the federal New Source Performance Standards (NSPS) for the combustion turbines (40 CFR 60 Subpart GG). This regulation has pollutant emission requirements that are less stringent than those that will be required by NSR requirements for Best Available Control Technology (BACT).

The U.S. EPA reviews and approves the SJVAPCD (District) regulations and has delegated to the SJVAPCD the implementation of the federal NSR, Title V, and NSPS programs. The District implements these programs through its own rules and regulations, which are, at a minimum, as stringent as the federal regulations. The Title V program is administered by the District under Rule 2520. In addition, the U.S. EPA has also delegated to the District the authority to implement the federal Clean Air Act Title IV "acid rain" program. The Title IV regulation requirements will include obtaining a Title IV permit prior to operation, the installation of continuous emission monitors to monitor acid deposition precursor pollutants, and obtaining Title IV allowances for emissions of SO_x. Rule 2540 implements the federal Title IV program. Therefore, compliance with the District's rules and regulations should result in compliance with federal Title IV and Title V requirements.

STATE

The California State Health and Safety Code, Section 41700, requires that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any 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

The proposed project is subject to the following San Joaquin Valley Air Pollution Control District (District) Rules and Regulations:

Rule 1080 – Stack Monitoring

This rule grants the Air Pollution Control Officer the authority to request the installation and use of continuous emissions monitors (CEM's), and specifies performance standards for the equipment and administrative requirements for record keeping, reporting, and notification.

Rule 1081 – Source Sampling

This rule requires adequate and safe facilities for use in sampling to determine compliance with emission limits, and specifies methods and procedures for source testing and sample collection.

Rule 1100 – Equipment Breakdown

This rule defines a breakdown condition, the procedures to follow if one occurs, and the requirements for corrective action, issuance of an emergency variance, and reporting. This rule is applied to the owner of any source operation with air pollution control equipment, or related operating equipment that controls air emissions, or continuous monitoring equipment.

Rule 2010 – Permits Required

This rule requires any person who is building, altering, replacing or operating any source that emits, may emit air contaminants, or may reduce emissions, to first obtain authorization from the District in the form of an Authority to Construct or a Permit to Operate.

Rule 2201 – New and Modified Stationary Source Review Rule

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

Section 4.1 – Best Available Control Technology

Best Available Control Technology (BACT) is defined as: a) the mandatory performance levels that are contained in any State Implementation Plan and that have been approved by EPA; b) the most stringent emission limitation or control technique that has been achieved in practice for a class of source; or c) any other emission limitation or control technique that the District's Air Pollution Control Officer (APCO) finds is technologically feasible and is cost effective. BACT is required for any new or modified emission unit that results in an emissions increase of 2.0 lb/day. However, Section 4.2.1 states that BACT is not required for CO emissions from any new or modified emissions unit if those sources emit less than 200,0000 lb/year of CO. In the case of WEC, BACT applies for NO_x, VOC, CO, SO_2, and PM_{10} emissions from all point sources of the project.

Section 4.5 – Emission Offset Requirements

Emissions offsets for new or modified sources are required when those sources are equal to or exceed the following emission levels:

- Oxides of Nitrogen, NO_x – 20,000 lbs/year;
- Volatile Organic Compounds, VOC – 20,000 lbs/year;
- Carbon Monoxide, CO – 200,000 lbs/year;
- PM_{10} – 29,200 lbs/year;
- Sulfur Oxides, SO_x – 54,750 lbs/year.

If constructed, the WEC would exceed all of the above emission levels, except SO_x.

Section 4.6 – Emission Offset Exemptions

Emissions offsets are not required for increases of CO in attainment areas, if the applicant demonstrates that the emissions increase will not cause or contribute to a violation of the ambient air quality standards, and that those emissions are consistent with Reasonable Further Progress.

Section 4.6.2 also exempts emergency equipment that is used exclusively as emergency standby equipment for electrical power generation that does not operate more than 200 hours per year for non-emergency purposes and is not used pursuant to voluntary arrangements with a power supplier to curtail power.

Section 4.8 – Distant Offset Ratio

The emission offsets provided shall be adjusted according to the distance of the offset from the project proposed site. The ratios are:

- Internal or on-site source – 1 to 1;
- Within 15 miles of the source – 1.2 to 1 (non-major source), 1.3 to 1 (major source); and
- 15 miles or more from the source – 1.5 to 1.

Sections 4.9/4.10 – Pre/Post-Project Stationary Source Potential to Emit

Sections 4.9.2 and 4.10.2 state that the Pre/Post-Project Stationary Source Potential to Emit (SSPE) include Actual Emissions Reductions, which have been banked since September 19, 1991, that have occurred at the source, and have not been used on-site. This includes all Emission Reduction Credits (ERCs) held as certificates and all ERCs that have been sold or transferred.

Section 4.13 – Additional Offset Requirements

Section 4.13.1 specifies that major sources (defined as those sources that emit greater than 25 tons of NO_x and VOC and 70 tons of PM_{10}) that are shutdown and thus generate an ERC may not be used as an offset for new major source (like WEC) unless those ERCs are included in an EPA-approved attainment plan.

Section 4.13.2 states that offsets from another district may be used if the source of the offsets is within 50 miles of the proposed emission increase. The Air Pollution Control Officer (APCO) must review the permit conditions and certify that such offsets meet the requirements of this rule and CH&SC Section 40709.6.

Section 4.13.3 allows for the use of interpollutant offsets (including PM_{10} precursors for PM_{10}) on a case-by-case basis, provided that the applicant demonstrates that the emissions increase will not cause a violation of any ambient air quality standard. The ratio for interpollutant trading shall be based on an air quality analysis and shall be equal to or greater than the minimum offsetting requirement (the distance ratios) of this rule (Section 4.8).

Section 4.13.4 requires Actual Emissions Reductions (AER) used as offsets to have occurred during the same calendar quarter as the emissions increases being offset. Exceptions to this rule (4.13.6 through 4.13.9) allow PM emission reductions that occurred from October through March to offset PM emissions occurring anytime during the year, for NO_x and VOC emission reductions that occurred from April through November to offset NO_x and VOC emissions occurring anytime during the year, and for CO emission reductions that occurred from November through February to offset CO emissions occurring anytime during the year.

Section 4.14 – Additional Source Requirements

Section 4.14.2 requires that a new source not cause, or make worse, the violation of an ambient air quality standard as demonstrated through analysis with air dispersion models.

Section 4.14.3 requires that the applicant of a proposed new major source demonstrate to the satisfaction of the District that all major stationary sources subject to emission limitations that are owned or operated by the applicant or any entity controlling or under common control with the applicant in California, are in compliance or on a schedule for compliance with all applicable emission limitations and standards.

Rule 2520 – Federally Mandated Operating Permits

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

Rule 2540 – Acid Rain Program

A project greater than 25 megawatts (MW) and installed after November 15, 1990, must submit an acid rain program permit application to the District. The acid rain requirements will become part of the Title V Operating Permit (Rule 2520). The specific requirements for the WEC project are discussed in the “Compliance with LORS – Local” later in this analysis.

Rule 4001 – New Source Performance Standards

Rule 4001 specifies that a project must meet the requirements of the Federal New Source Performance Standards (NSPS), according to Title 40, Code of Federal Regulations, Part 60, Chapter 1. Subpart GG, which pertains to Stationary Gas Turbines, requires that a project meet specific NO_x concentration limits, based on the heat rate of combustion. In addition, the SO_2 concentration shall be less than 150 parts per million by volume (ppmv) and the sulfur content of the fuel shall be no greater than 0.8 percent by weight.

Rule 4101 – Visible Emissions

Prohibits visible air emissions, other than water vapor, of more than No. 1 on the Ringelmann chart (20 percent opacity) for more than three minutes in any one-hour.

Rule 4102 – Nuisance

Prohibits any emissions "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 person or public or which cause or have a natural tendency to cause injury or damage to business or property."

Rule 4201 – Particulate Matter Concentration

Limits particulates emissions from any source that emits or may emit dust, fumes, or total suspended particulate matter to less than 0.1 grain per dry standard cubic foot (gr/dscf) of gas calculated to 12 percent of carbon dioxide.

Rule 4202 – Particulate Matter Emission Rate

This rule limits particulate matter emissions for any source operation, which emits or may emit particulate matter emissions, by establishing allowable emission rates. Calculation methods for determining the emission rate based on process weight are specified.

Rule 4701 – Stationary Internal Combustion Engines

Limits NO_x, CO and VOC emissions from internal combustion engines rated greater than 50 brake horsepower (bph) that require a Permit to Operate. Since the fire pump proposed for this project will be used exclusively for fire fighting services and will be limited to 100 hours per year of non-emergency operation, it is exempt from this rule.

Rule 4703 – Stationary Gas Turbines

Limits NO_x emissions from stationary gas turbines. Establishes requirements for monitoring and record keeping for NO_x and CO emissions from new or modified stationary gas turbines with a designed power of 0.3 MW or higher.

Rule 4801 – SO_2 Concentration

Limits the emissions of sulfur compounds to no greater than 0.2 percent by volume calculated as SO_2 on a dry basis.

Rule 7012 – Hexavalent Chromium – Cooling Towers

This rule limits emissions of hexavalent chromium from circulating water in cooling towers and prohibits the use or sale of products containing these compounds for treating cooling tower water. Record keeping and monitoring requirements, test methods for determining emission concentration limits, and an implementation schedule are specified.

REGULATION VIII - FUGITIVE PM10 PROHIBITIONS

Rule 8011 – General Requirements

Specifies the types of chemical stabilizing agents and dust suppressant materials that can (and cannot) be used to minimize fugitive dust from anthropogenic (man-made) sources. The rule also specifies test methods for determining compliance with visible

dust emission (VDE) standards, stabilized surface conditions, soil moisture content, silt content for bulk materials, silt content for unpaved roads and unpaved vehicle/equipment traffic areas, and threshold friction velocity (TFV). Records shall be maintained only for those days that a control measure was implemented, and kept for one year following project completion to demonstrate compliance. A fugitive dust management plan for unpaved roads and unpaved vehicle/equipment traffic areas is discussed as an alternative for Rule 8061 and Rule 8071.

Rule 8021 – Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities

Requires fugitive dust emissions throughout construction activities (from pre-activity to active operations and during periods of inactivity) to comply with the conditions of a stabilized unpaved road surface and to not exceed an opacity limit of 20 percent, by means of water application, chemical dust suppressants, or constructing and maintaining wind barriers. A Dust Control Plan is also required and shall be submitted to the APCO at least 30 days prior to the start of any construction activities on any site that include 40 acres or more of disturbed surface area, or will include moving more than 2,500 cubic yards per day of bulk materials on at least three days.

Rule 8031 – Bulk Materials

Limits the fugitive dust emissions from the outdoor handling, storage and transport of bulk materials. Requires fugitive dust emissions to comply with the conditions of a stabilized unpaved road surface and to not exceed an opacity limit of 20 percent. It specifies that bulk materials be transported using wetting agents, allow appropriate freeboard space in the vehicles, or be covered. It also requires that stored materials be covered or stabilized.

Rule 8041 – Carryout and Trackout

Limits carryout and trackout during construction, demolition, excavation, extraction, and other earthmoving activities (Rule 8021), from bulk materials handling (Rule 8031), and from unpaved vehicle and equipment traffic areas (Rule 8071) where carryout has occurred or may occur. Specifies acceptable (and unacceptable) methods for cleanup of carryout and trackout.

Rule 8051 – Open Areas

Requires fugitive dust emissions from any open area having three acres or more of disturbed surface area, that has remained undeveloped, unoccupied, unused, or vacant for more than seven day to comply with the conditions of a stabilized unpaved road surface and to not exceed an opacity limit of 20 percent, by means of water application, chemical dust suppressants, paving, applying and maintaining gravel, or planting vegetation.

Rule 8061 – Paved and Unpaved Roads

Specifies the width of paved shoulders on paved roads and guidelines for medians. Requires gravel, roadmix, paving, landscaping, watering, and/or the use of chemical dust suppressants on unpaved roadways to prevent exceeding an opacity limit of 20 percent. Exemptions to this rule include “any unpaved road segment with less than 75 vehicle trips for that day.”

Rule 8071 – Unpaved Vehicle/Equipment Traffic Areas

This rule intends to limit fugitive dust from unpaved vehicle and equipment traffic areas one acre or larger by using gravel, roadmix, paving, landscaping, watering, and/or the use of chemical dust suppressants to prevent exceeding an opacity limit of 20 percent. Exemptions to this rule include "unpaved vehicle and equipment traffic areas on any day which less than 75 vehicle trips occur."

Rule 8081 – Agricultural Sources

This rule intends to limit fugitive dust from off-field agricultural sources exempted from Rules 8031 (Bulk Materials), 8061 (Paved and Unpaved Roads), and 8071 (Unpaved Vehicle/Equipment Traffic Areas). Requires fugitive dust emissions to comply with the conditions of a stabilized surface and to not exceed an opacity limit of 20 percent.

SETTING

METEOROLOGICAL CONDITIONS

The climate of the San Joaquin Valley is controlled by a semi-permanent subtropical high-pressure system that is located off the Pacific Ocean. In the summer, this strong high-pressure system results in clear skies, high temperatures, and low humidity. Very little precipitation occurs during the summer months because storms are blocked by the high-pressure system. Beginning in the fall and continuing through the winter, the high pressure weakens and moves south, allowing storm systems to move through the area. Temperature, winds, and rainfall are more variable during these months, and stagnant conditions occur more frequently than during summer months. Weather patterns include periods of stormy weather with rain and gusty winds, clear weather that can occur after a storm, or persistent fog. The project site receives an average of 12 inches of rain annually.

Temperature, wind speed, and wind direction data have been collected at the Modesto Airport. The predominant annual wind direction in the project area is from the north through west-northwest (northwestern quadrant). The northwest quadrant wind direction is particularly predominating during the spring, summer, and fall. The winds during the winter show two almost equal predominate directions, from the northwest quadrant and from the southeast quadrant (i.e. up and down valley directions). The wind speeds are generally higher during daylight hours and during the spring, summer, and fall.

Along with the wind flow, atmospheric stability and mixing heights are important factors in the determination of pollutant dispersion. Atmospheric stability reflects the amount of atmospheric turbulence and mixing. In general, the less stable an atmosphere, the greater the turbulence, which results in more mixing and better dispersion. The mixing height, measured from the ground upward, is the height of the atmospheric layer in which convection and mechanical turbulence promote mixing. Good ventilation results from a high mixing height and at least moderate wind speeds with the mixing layer.

EXISTING AIR QUALITY

The project is located within the jurisdiction of the San Joaquin Valley Air Pollution Control District (District). The applicable federal and California ambient air quality standards (AAQS) are presented in **AIR QUALITY Table 1**. As indicated in this table, the averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to annual average. The standards are read as a mass fraction, in parts per million (ppm), or as a concentration, in milligrams or micrograms of pollutant per cubic meter of air (mg/m^3 or µg/m^3).

AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	1 Hour	0.12 ppm (235 µg/m^3)	0.09 ppm (180 µg/m^3)
	8 Hour	0.08 ppm (160 µg/m^3)	—
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 µg/m^3)	—
	1 Hour	—	0.25 ppm (470 µg/m^3)
Sulfur Dioxide (SO_2)	Annual Average	0.03 ppm (80 µg/m^3)	—
	24 Hour	0.14 ppm (365 µg/m^3)	0.04 ppm (105 µg/m^3)
	3 Hour	0.5 ppm (1300 µg/m^3)	—
	1 Hour	—	0.25 ppm (655 µg/m^3)
Respirable Particulate Matter (PM_{10}) [a]	Annual Geometric Mean	—	30 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
	Annual Arithmetic Mean	50 µg/m^3	—
Fine Particulate Matter ($PM_{2.5}$) [a]	Annual Arithmetic Mean	15 µg/m^3	—
	24 Hour	65 µg/m^3	—
Sulfates (SO_4)	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.010 ppm (26 µg/m^3)
Visibility Reducing Particulates	1 Observation (8 hour)	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

Note(s):

a. The State of California is currently in the process of revising its annual PM_{10} ambient air quality standard and in the process of enacting $PM_{2.5}$ ambient air quality standards. The standards being proposed as of January 13, 2003 are as follows:

PM_{10} – 20 ug/m^3 (annual standard - arithmetic mean)

$PM_{2.5}$ – 12 ug/m^3 (annual standard - arithmetic mean)

The U.S. Environmental Protection Agency (U.S. EPA), California Air Resource Board (CARB), and the local air district classify an area as attainment, unclassified, or nonattainment, depending on whether or not the monitored ambient air quality data show compliance, insufficient data is available, or non-compliance with the ambient air quality standards, respectively. The WEC is located within the San Joaquin Valley Air Basin and, as stated above, is under the jurisdiction of the San Joaquin Valley Air Pollution Control District. This area is designated as nonattainment for both the federal and state ozone and PM_{10} standards. **AIR QUALITY Table 2** summarizes federal and state attainment status of criteria pollutants for the San Joaquin Valley Air Basin.

AIR QUALITY Table 2
Federal and State Attainment Status for the San Joaquin Valley Air Basin

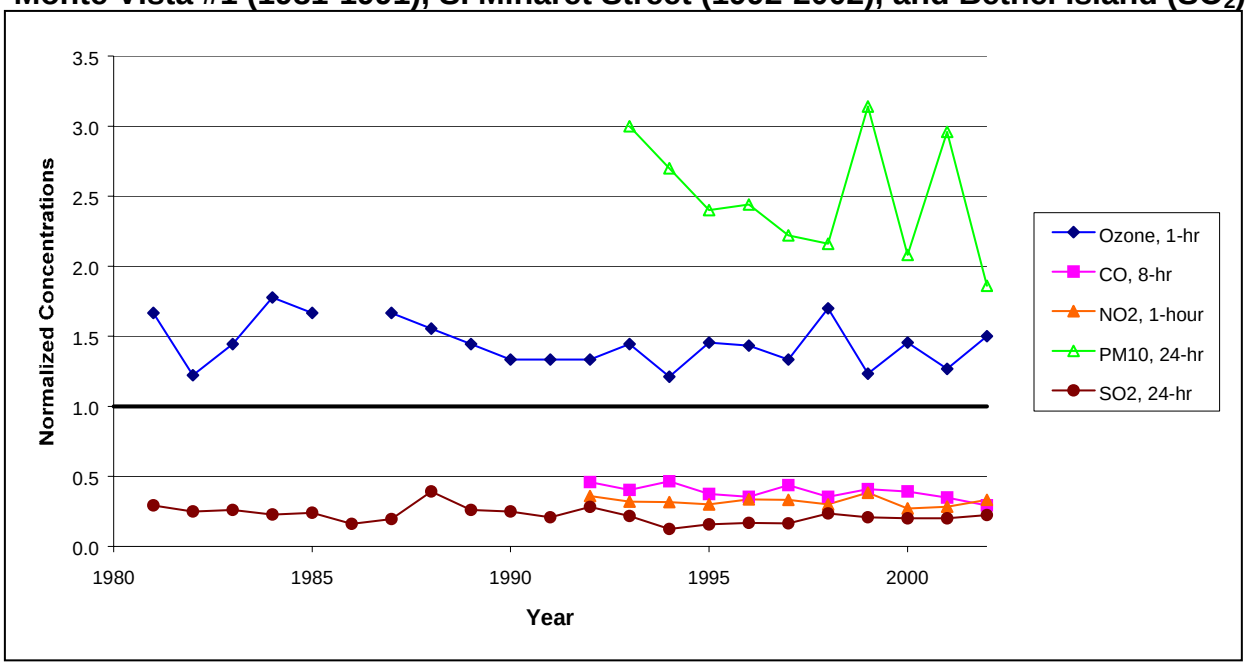
Pollutant	Attainment Status	
	Federal	**State**
Ozone – One hour	Severe Nonattainment [a]	Severe Nonattainment
CO	Unclassified/Attainment [b]	Attainment
NO_2	Unclassified/Attainment [b]	Attainment
SO_2	Unclassified	Attainment
PM_{10}	Serious Nonattainment	Nonattainment
Lead	No Designation	Attainment

Source: 40 CFR 81 and SJVAPCD web site accessed January 2003 (www.valleyair.org/aqinfo/attainment.htm).
a. Region 9 News Release San Francisco, CA, "U.S. EPA Downgrades San Joaquin Valley Air," October 23, 2001 (Ozone).
b. Unclassified/Attainment – The attainment status for the subject pollutant is classified as either attainment or unclassified.

The project site is in Stanislaus County, at the western edge of the City of Turlock. The monitoring station closest to the proposed project site is the Turlock South Minaret Street Station, located approximately 3.6 miles from the project site. This station monitors ambient concentrations of ozone, CO, NO_2, and PM_{10}. Prior to the use of the Turlock South Minaret Street Station, the Turlock Monte Vista #1 Station measured PM_{10} concentrations (1981 to 1992). Fine particulate matter ($PM_{2.5}$) is recorded at the Modesto 14th Street and Merced "M" Street Stations, located approximately 15 miles northwest and 25 miles southeast, respectively, from the project site. The nearest monitoring station for SO_2 is at Bethel Island, about 55 miles from the project site. The Modesto, Merced, and Bethel Island monitoring stations are considered the most representative monitoring stations for the WEC site, with available $PM_{2.5}$ and SO_2 monitoring data.

AIR QUALITY Figure 1 summarizes the historical air quality data for the project location, recorded at the Turlock Monte Vista #1 (1981-1991), Turlock South Minaret Street (1992-2002), and Bethel Island (SO_2 only) air monitoring stations for ozone, PM_{10}, NO_2, CO, and SO_2. In **AIR QUALITY Figure 1**, the short term normalized concentrations are provided from 1981 to 2002. Normalized concentrations represent the ratio of the highest measured concentrations in a given year to the most-stringent applicable national or state ambient air quality standard. Therefore, normalized concentrations lower than one indicate that the measured concentrations were lower than the most-stringent ambient air quality standard.

AIR QUALITY Figure 1
Normalized Maximum Short-Term Historical Air Pollutant Concentrations
Monte Vista #1 (1981-1991), S. Minaret Street (1992-2002), and Bethel Island (SO_2)



A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. For example, in 1999 the highest one-hour average ozone concentration measured in Turlock was 0.111 ppm. Since the most stringent ambient air quality standard is the state standard of 0.09 ppm, the 1999 normalized concentration is 0.111/0.09 = 1.23. Source: (CARB 2000).

Following is a more in-depth discussion of ambient air quality conditions in the project area.

Ozone

In the presence of ultraviolet radiation, both nitrogen oxides (NO_x) and volatile organic compounds (VOC) go through a number of complex chemical reactions to form ozone. **AIR QUALITY Table 3** summarizes the best representative ambient ozone data collected from the Turlock South Minaret Street monitoring station. The table includes the maximum one-hour and eight-hour ozone levels and the number of days above the state or national standards. Ozone formation is higher in spring and summer and lower in the winter. The San Joaquin Valley air basin is classified as an extreme nonattainment area for ozone because it violates both National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS).

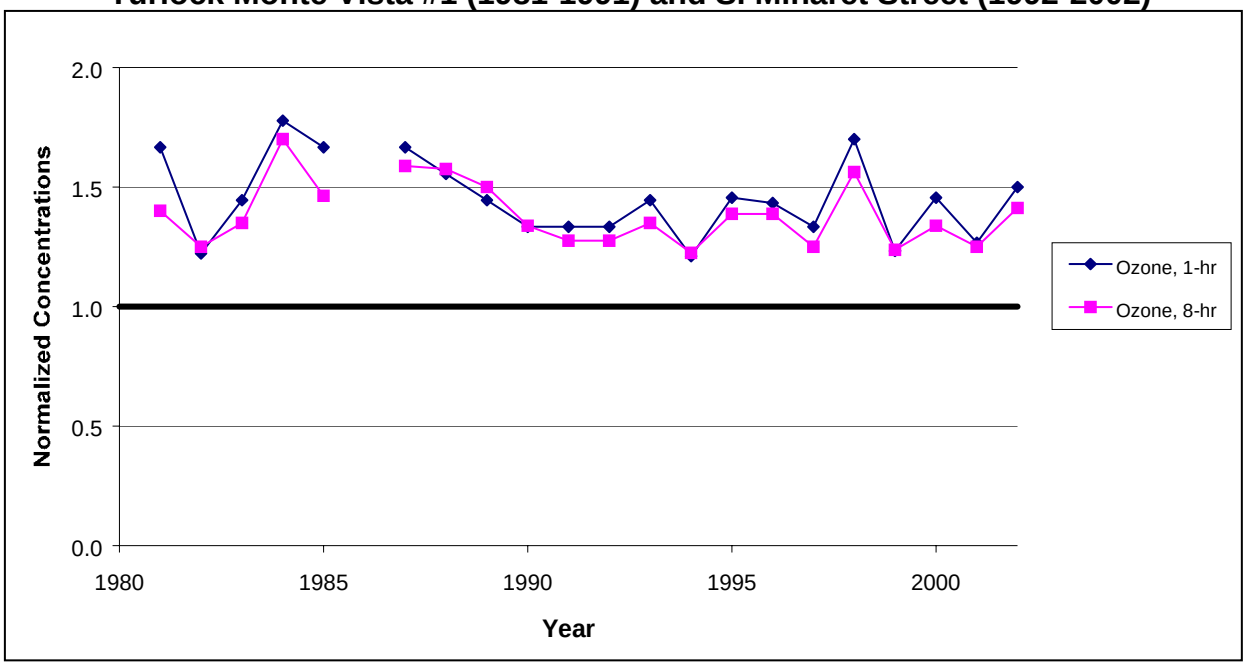
AIR QUALITY Table 3
Ozone Air Quality Summary, 1992-2002 (ppm)

Year	Turlock South Minaret Street					
	Days Above CAAQS 1-Hr	Month of Max. 1-Hr Avg.	Max. 1-Hr Avg.	Days Above NAAQS 8-Hr	Month of Max. 8-Hr Avg.	Max. 8-Hr Avg.
1992	24	JUN	0.120	11	JUN	0.102
1993	15	JUN	0.130	11	JUN	0.108
1994	15	JUN	0.109	10	JUN	0.098
1995	26	JUL	0.131	18	JUL	0.111
1996	37	AUG	0.129	19	AUG	0.111
1997	15	AUG	0.120	8	AUG	0.10
1998	35	AUG	0.153	29	AUG	0.125
1999	12	JUL	0.111	9	JUL	0.099
2000	15	AUG	0.131	10	AUG	0.107
2001	9	MAY	0.114	7	JUL	0.100
2002	31	AUG	0.135	25	AUG	0.113

California Ambient Air Quality Standard (CAAQS): 1-Hr, 0.09 ppm
National Ambient Air Quality Standard (NAAQS): 1-Hr, 0.12 ppm; 8-Hr, 0.08 ppm
Source: CARB web site, http://www.arb.ca.gov/adam/, Accessed April 2003.
Source: CARB Air Quality Data CD, November 2000 (1980-1999).

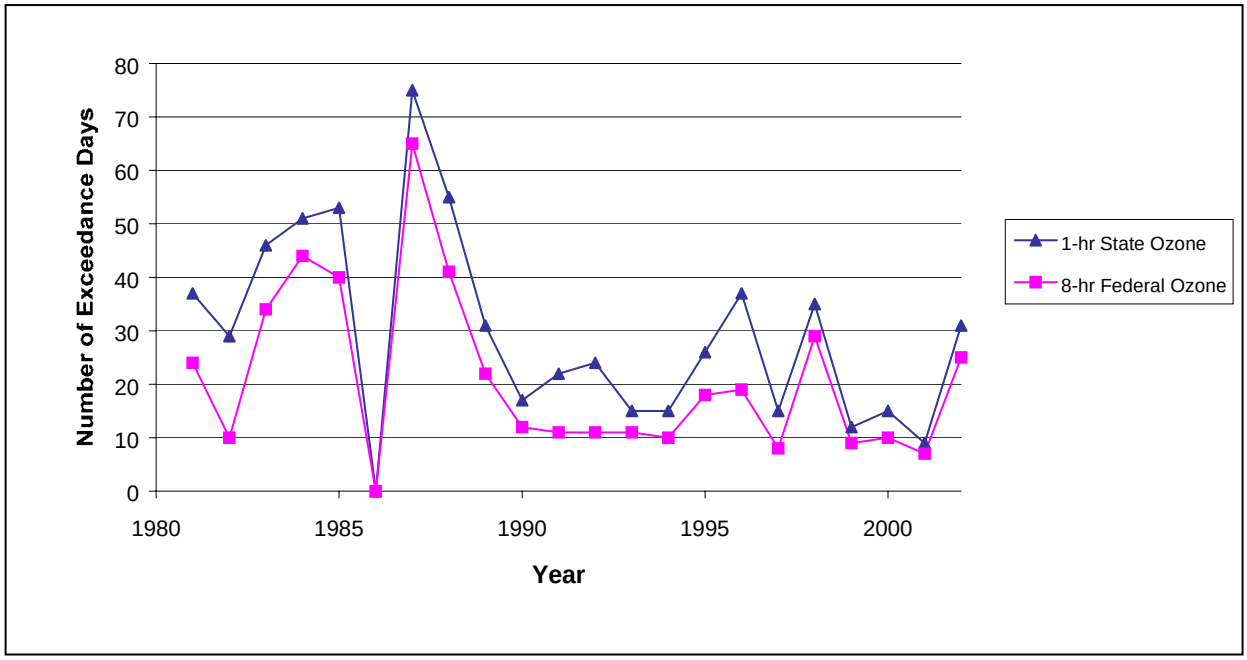
The yearly trends from 1981 to 2002 for the maximum one-hour and eight-hour ozone concentrations, referenced to the most stringent standard, and the number of days exceeding the California one-hour standard and the Federal eight-hour standard for the Turlock Monte Vista #1 (1981-1991) and Turlock S. Minaret Street (1992-2002) monitoring stations are shown in **AIR QUALITY Figure 2** and **Figure 3**, respectively.

AIR QUALITY Figure 2
Normalized Ozone Air Quality Maximum Concentrations
Turlock Monte Vista #1 (1981-1991) and S. Minaret Street (1992-2002)



A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for one-hour ozone is the state standard of 0.09 ppm, and for eight-hour ozone is the national standard of 0.08 ppm.

AIR QUALITY Figure 3
Ozone – Number of Days Exceeding the Air Quality Standards
Turlock Monte Vista #1 (1981-1991) and S. Minaret Street (1992-2002)



Source: CARB 2000, 2003

As these two figures show, the one-hour and eight-hour ozone concentrations peaked in 1984, and the number of exceedances peaked in 1987. However, there has been little or no improvement in the peak concentrations and number of exceedances since 1990.

Inhalable Particulate Matter (PM_{10})

As **AIR QUALITY Table 4** indicates, the project area annually experiences a number of violations of the state 24-hour PM_{10} standard. In the last 10 years, however, the federal 24-hour standard has generally been met (except for 1993 and 1999). Annual Geometric Mean PM_{10} levels are generally above the state standard (except for 1996, 1998, and 2000). Annual Arithmetic Mean PM_{10} levels have been below the federal standard since 1994. The San Joaquin Valley air basin is considered to be in nonattainment of both federal and state PM_{10} standards.

AIR QUALITY Table 4

PM_{10} Air Quality Summary, 1992-2002 ($\mu g/m^3$)

Year	Turlock South Minaret Street				
	Days * Above Daily CAAQS	Month of Max. Daily Avg.	Max. Daily Avg.	Annual Geometric Mean	Annual Arithmetic Mean
1992	---	---	---	---	---
1993	102	NOV	150	43	52
1994	90	JAN	135	36	41
1995	90	NOV	120	35	42
1996	45	NOV	122	28	32
1997	54	JAN	111	33	37
1998	48	DEC	108	25	31
1999	63	OCT	157	32	35
2000	57	DEC	104	29	33
2001	60	JAN	148	33	39
2002	72	NOV	93	31	34

California Ambient Air Quality Standard: 24-Hr, 50 $\mu g/m^3$; Annual Geometric, 30 $\mu g/m^3$
National Ambient Air Quality Standard: 24-Hr, 150 $\mu g/m^3$; Annual Arithmetic, 50 $\mu g/m^3$
Source: CARB web site, http://www.arb.ca.gov/adam/, Accessed April 2003.
Source: CARB Air Quality Data CD, November 2000 (1980-1999).
Source: AFC (TID 2002a) Table 8.1-7. Note that the data for Annual Arithmetic Mean provided in Table 8.1-7 do not match the numbers provided by CARB. Data from the CARB website was used for 1999-2002.

* Days above the state standard (calculated): Because PM_{10} is monitored approximately once every six days, the potential number of violation days is calculated by multiplying the actual number of days of violations by six.

PM_{10} can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NO_x, SO_x and VOC from turbines, and ammonia from NO_x control equipment, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

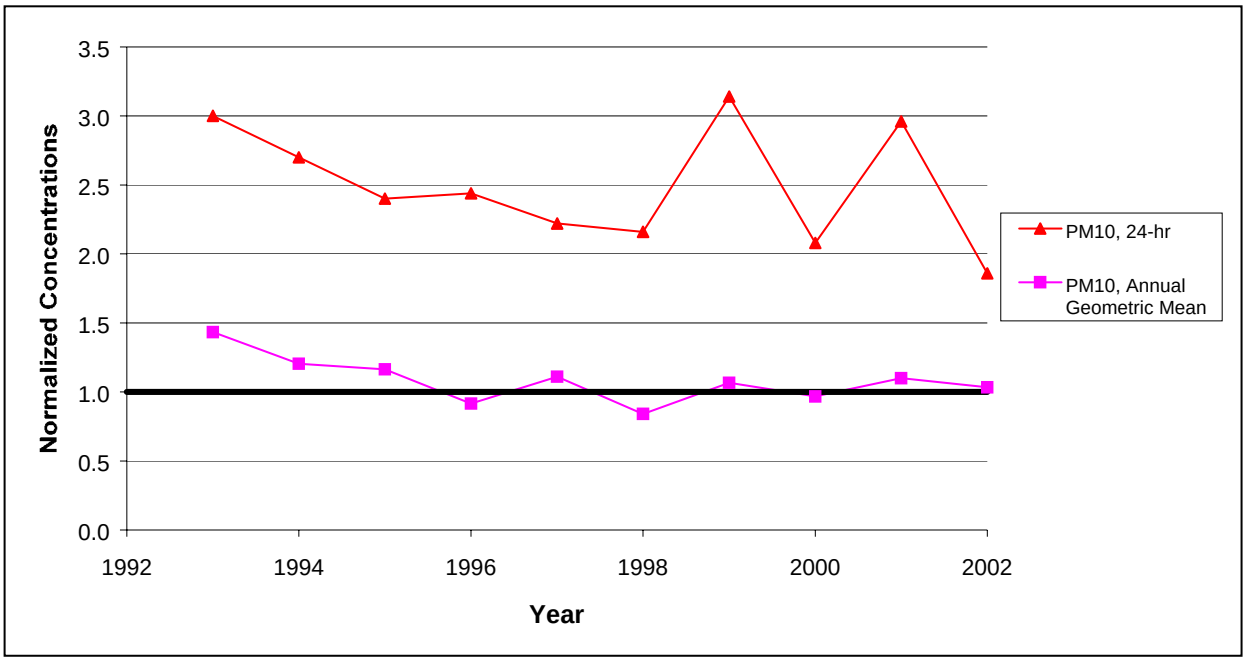
PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NO_x emissions from combustion sources. The nitrate ion concentrations during the wintertime are a significant portion of the total PM_{10}, and should be even a higher contributor to particulate matter of less than 2.5 microns ($PM_{2.5}$). The nitrate ion is only a portion of the PM nitrate, which can be in the form of ammonium nitrate (ammonium plus nitrate ions) and some as sodium nitrate. If the ammonium and the sodium ions associated with the nitrate ion are taken into consideration, PM nitrate contributions to the total PM would even more significant.

As shown in **AIR QUALITY Table 4**, the highest PM concentrations are measured in the fall and winter when there are frequent low-level inversions. During the wintertime high PM episodes, the contribution of ground level releases to ambient PM concentrations is disproportionately high.

The 1992 to 2002 yearly trends for the maximum 24-hour PM_{10} and Annual Geometric Mean PM_{10}, referenced to the most stringent standard, and the number of days exceeding the California 24-hour PM_{10} standard for the Turlock South Minaret Street monitoring station are shown in **AIR QUALITY Figure 4** and **Figure 5**, respectively.

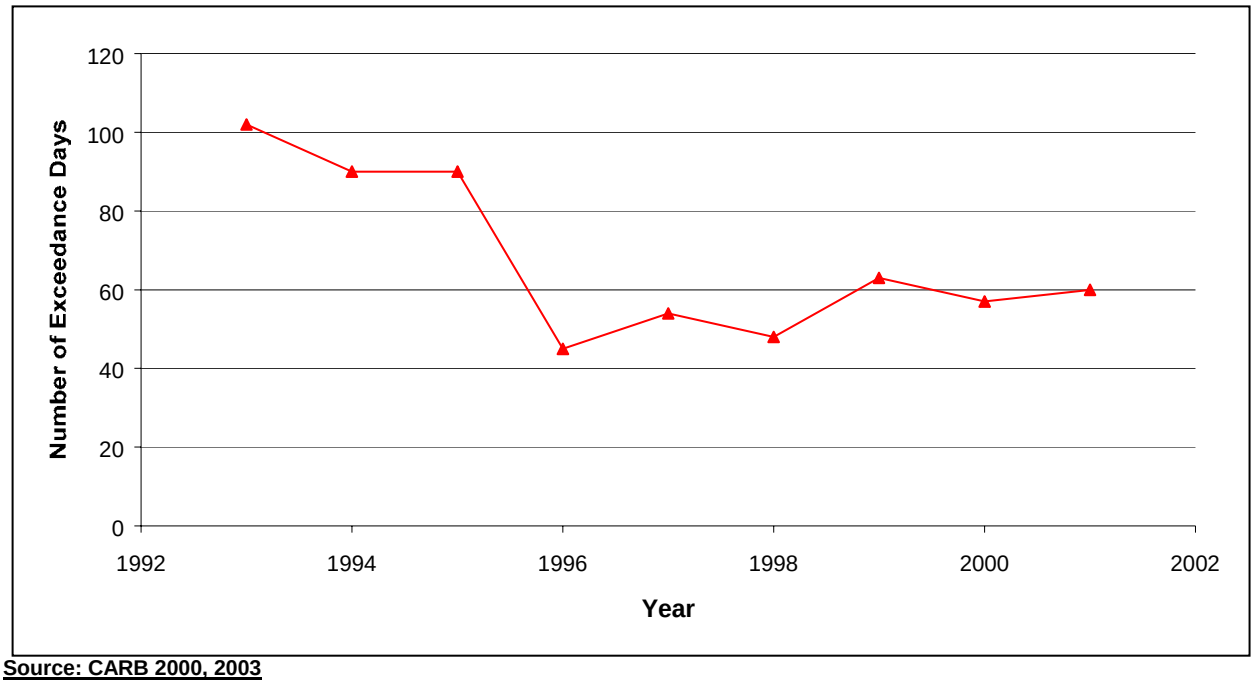
As the two figures show, there is an overall gradual downward trend for PM_{10} concentrations and number of violations of the California 24-Hour Standard since 1993; however, there has been little or no progress since 1996.

AIR QUALITY Figure 4
Normalized PM_{10} Air Quality Maximum Concentrations
Turlock South Minaret Street (1992-2002)



A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for 24-hour PM_{10} is the state standard of 50 $\mu g/m^3$, and for the Annual Geometric Mean is the state standard of 30 $\mu g/m^3$.
Source: CARB 2000, 2003.

AIR QUALITY Figure 5
PM_{10} 24-Hour – Number of Days Exceeding the Air Quality Standard
South Minaret Street (1993-2002)



Source: CARB 2000, 2003

Inhalable Particulate Matter ($PM_{2.5}$)

The air agencies in California are now deploying $PM_{2.5}$ ambient air quality monitors throughout the state. $PM_{2.5}$ ambient air quality attainment plans, if needed, are due to the U.S. EPA by 2005.

As shown in **AIR QUALITY Table 4**, the highest PM concentrations are measured in the fall and winter. The relative contribution of wood-smoke particles to the $PM_{2.5}$ concentrations may be even higher than its relative contribution to PM_{10} concentrations, considering that most of the wood-smoke particles are smaller than 2.5 microns.

As **AIR QUALITY Table 5** indicates, the 98th percentile 24-hour average $PM_{2.5}$ concentration levels have been declining from 1999-2002, but continue to remain slightly above the proposed NAAQS of 65 $\mu g/m^3$, except for 2002 when data from Merced was below the NAAQS. The three year average of annual arithmetic means (national annual average) has also been declining from 1999-2002, but continues to be above the proposed NAAQS of 15 $\mu g/m^3$. Attainment for $PM_{2.5}$ will be based on the entire air basin. If attainment classification were to take effect now using current ambient air quality data, the SJVAB would be found to be in non-attainment.

AIR QUALITY Table 5
$PM_{2.5}$ Air Quality Summary, 1999-2002 ($\mu g/m^3$)

Year	Modesto – 14th Street					
	Max. Daily Avg.	98th Percentile of Max. Daily Avg.	Days * Above 98th Percentile Daily NAAQS	3-Yr. Avg. 98th Percentile of Max. Daily Avg.	National Annual Avg.	3-Yr. Avg. of National Annual Avg.
1999	108	100.0	66	---	24.9	---
2000	77	71.0	30	---	18.7	---
2001	95	69.0	18	80	15.6	19.7
2002	83	69.0	18	70	18.7	17.7
	Merced – 2334 "M" Street					
1999	108.7	---	42	---	22.6	---
2000	86.1	68.4	18	---	17.3	---
2001	87.0	70.1	18	---	16.8	18.9
2002	66.0	55.1	6	65	18.8	17.6

National Ambient Air Quality Standard: 3-Year Average - 98th Percentile of 24-Hr Avg. Conc., 65 $\mu g/m^3$; 3-Year Average of Annual Arithmetic Mean (National Annual Average), 15 $\mu g/m^3$
Source: CARB web site, http://www.arb.ca.gov/adam/, Accessed April 2003.

* Days above the state standard (calculated): Because $PM_{2.5}$ is monitored approximately once every six days, the potential number of exceedence days is calculated by multiplying the actual number of days of violations by six.

Carbon Monoxide (CO)

As **AIR QUALITY Table 6** shows, the maximum one-hour and eight-hour CO concentrations in the Turlock area are less than the California Ambient Air Quality Standards. CO is considered a local pollutant, as it is found in high concentrations only near the source of emission. Automobiles and other mobile sources are the principal sources of the CO emissions. High levels of CO emissions can also be generated from fireplaces and wood-burning stoves. According to the data recorded at the Turlock South Minaret Street air monitoring station, there have been no violations of California Ambient Air Quality Standards or National Ambient Air Quality Standards since at least 1992 for the one-hour and the eight-hour CO standards (see **AIR QUALITY Table 6**).

The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime, late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since mobile sources (motor vehicles) are the main cause of CO, ambient concentrations of CO are highly dependent on motor vehicle activity. In fact, the peak CO concentrations occur during the rush hour traffic in the mornings and afternoons. Carbon monoxide concentrations in Stanislaus County and the rest of the state have declined significantly due to two state-wide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to the decline in CO levels in the state. Today, all the areas of California,

with the sole exception of certain locations within Los Angeles County, are in compliance with the CO ambient air quality standards.

AIR QUALITY Table 6
CO Air Quality Summary, 1992-2002 (ppm)

Year	Turlock South Minaret Street		
	Month of Max. 1-Hr Average	Maximum 1-Hr Average	Maximum 8-Hr Average
1992	NOV	5.0	4.13
1993	NOV	5.0	3.63
1994	NOV	7.0	4.18
1995	JAN	4.1	3.36
1996	NOV	5.1	3.19
1997	DEC	5.2	3.93
1998	DEC	4.5	3.19
1999	DEC	4.2	3.67
2000	DEC	5.0	3.53
2001	JAN	4.2	3.14
2002	---	---	2.64

California Ambient Air Quality Standard: 1-Hr, 20 ppm; 8-Hr, 9 ppm
National Ambient Air Quality Standard: 1-Hr, 35 ppm; 8-Hr, 9 ppm
Source: CARB web site, http://www.arb.ca.gov/adam/, Accessed April 2003.
Source: CARB Air Quality Data CD, November 2000 (1980-1999).
Source: AFC (TID 2002a) Table 8.1-4. 2000-2001 1-Hr. Avg.

Nitrogen Dioxide (NO_2)

As shown in **AIR QUALITY Table 7** the maximum one-hour and annual concentrations of NO_2 at the Turlock South Minaret Street Station are lower than California and National Ambient Air Quality Standards. Approximately 75 to 90 percent of the NO_x emitted from combustion sources is NO, while the balance is NO_2. NO is oxidized in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 occur during the fall and not in the winter, when atmospheric conditions favor the trapping of ground level releases, but lack significant photochemical activity (less sunlight). In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the California one-hour ambient air quality standard. The formation of NO_2 in the summer, in the presence of ozone, is according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

In urban areas, ozone concentration levels are typically high. These levels drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in downwind rural areas (without sources of fresh NO_x emissions) ozone concentrations can remain relatively high.

AIR QUALITY Table 7
NO_2 Air Quality Summary, 1992-2002 (ppm)

Year	Turlock South Minaret Street		
	Month of Max. 1-Hr Average	Maximum 1-Hr Average	Maximum Annual Average
1992	OCT	0.090	0.021
1993	NOV	0.080	0.019
1994	OCT	0.079	0.018
1995	NOV	0.075	0.017
1996	OCT	0.084	0.017
1997	OCT	0.083	0.018
1998	OCT	0.075	0.018
1999	OCT	0.096	0.019
2000	SEP	0.068	0.016
2001	OCT	0.071	0.017
2002	SEP	0.083	0.018

California 1-Hr Ambient Air Quality Standard: 0.25 ppm
National Annual Ambient Air Quality Standard: 0.053 ppm
Source: CARB web site, http://www.arb.ca.gov/adam/, Accessed April 2003.
Source: CARB Air Quality Data CD, November 2000 (1980-1999).
Source: AFC (TID 2002a) Table 8.1-3. 1992 Annual Avg.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels, such as natural gas, contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content such as lignite (a type of coal), emit very large amounts of SO_2 when combusted.

Sources of SO_2 emissions within the San Joaquin Valley air basin come from every economic sector and include a wide variety of fuels: gaseous, liquid and solid. The San Joaquin Valley air basin is designated attainment for all the SO_2 state and federal ambient air quality standards. **AIR QUALITY Table 8** shows the historic one-hour, 24-hour and annual average SO_2 concentrations collected from the Contra Costa County Bethel Island Road Station, approximately 55 miles from the project site. As **AIR QUALITY Table 8** shows, concentrations of SO_2 are far below the state and federal SO_2 ambient air quality standards.

AIR QUALITY Table 8
SO_2 Air Quality Summary, 1992-2002 (ppm)

Year	Bethel Island Road, Contra Costa County			
	Maximum 1-Hr Avg.	Month of Max. 24-Hr Avg.	Maximum 24-Hr Avg.	Annual Average
1992	0.030	JUN	0.0113	0.0009
1993	0.020	APR	0.0087	0.0005
1994	0.019	MAY	0.0050	0.0012
1995	0.015	JUL	0.0063	0.0010
1996	0.014	AUG	0.0067	0.0014
1997	0.015	AUG	0.0066	0.0020
1998	0.028	SEP	0.0094	0.0018
1999	0.029	SEP	0.0083	0.0014
2000	0.018	JUN	0.008	0.002
2001	0.015	MAY	0.008	0.002
2002	---	JUL	0.009	0.002

California Ambient Air Quality Standard: 1-Hr, 0.25 ppm; 24-Hr, 0.04 ppm
National Ambient Air Quality Standard: 3-Hr, 0.5 ppm; 24-Hr, 0.14 ppm; Annual, 0.030 ppm
Source: CARB web site, http://www.arb.ca.gov/adam/, Accessed April 2003.
Source: CARB Air Quality Data CD, November 2000 (1980-1999).
Source: AFC (TID 2002a) Table 8.1-5. 2000-2001 1-Hr. Avg.

Visibility

Visibility in the region of the project site depends upon the area's natural relative humidity and the intensity of both particulate and gaseous pollution in the atmosphere. The most straightforward characterization of visibility is probably the visual range (the greatest distance that a large dark object can be seen). However, in order to characterize visibility over a range of distances, it is more common to analyze the changes in visibility in terms of the change in light-extinction that occurs over each additional kilometer of distance (1/km). In the case of a greater light-extinction, the visual range will decrease.

The San Joaquin Valley Air Basin is currently designated as unclassified for visibility reducing particles.

Summary

In summary, staff recommends the background ambient air concentrations in **AIR QUALITY Table 9** for the modeling and impacts analysis. The maximum criteria pollutant concentration from the past three years (2000-2002) from the following representative monitoring stations are used to determine the background values: Turlock South Minaret Street and Bethel Island Road.

The project site is located at the western edge of the City of Turlock in a predominately rural area, approximately 2.7 miles west of Highway 99, southeast of the intersection of West Main Avenue and South Washington Road. Where possible, the recommended background concentrations come from nearby monitoring stations with similar characteristics. Monitoring stations located within larger urban areas were not considered representative of this site. The recommended ozone, NO_2, PM_{10}, and CO

background concentrations are from the Turlock South Minaret Street monitoring station. The recommended SO_2 background concentration is from the Bethel Island Road monitoring station in Contra Costa County, which is the nearest representative monitoring station to the project site.

AIR QUALITY Table 9
Staff Recommended Background Concentrations for WEC (ppm)

Pollutant	Averaging Time	2000	2001	2002	Most Restrictive Ambient Air Quality Standard
Ozone	1 hour	0.131	0.114	0.135	0.09
	8 hour	0.107	0.100	0.113	0.08
PM_{10} ($\mu g/m^3$)	24 hours	104	**148**	93	50
	Annual Geometric Mean	29	**33**	31	30
	Annual Arithmetic Mean	33	**39**	34	50
NO_2	1 hour	0.068	0.071	**0.083**[c]	0.25
	Annual	0.016	0.017	**0.018**	0.053
CO	1 hour	**5.0**	4.2	ND	20
	8 hour	**3.53**	3.14	2.64	9
SO_2	1 hour	**0.018**	0.015	ND	0.25
	3 hour [b]	**0.016**	0.014	ND	0.5
	24 hours	0.008	0.008	**0.009**	0.04
	Annual	0.002	0.002	**0.002**	0.03

Note(s): ND – No Data available.
a. Bold values are the background concentrations used throughout the following air quality analysis.
b. 3-hour SO_2 value is assumed to equal 90% of one-hour SO_2 value.
c. The NO_x_OLM modeling conducted by the Applicant uses 1999 meteorological and hourly ozone data; therefore, for consistency the background NO_2 concentration used to assess the NO_x _OLM modeling results is the 1999 maximum hourly background of 0.096 ppm (180 ug/m^3)

PROJECT DESCRIPTION AND EMISSIONS

CONSTRUCTION

The WEC would include the following major elements at the project site:

- two General Electric Frame 7EA combustion turbine generators with two unfired heat recovery steam generators (HRSG) driving one steam turbine generator (STG);
- a five-cell mechanical draft cooling tower using recycled water from the City of Turlock's Regional Wastewater Treatment Plant (WWTP);
- a 300-horsepower (hp) diesel fire pump;
- a 115-kilovolt (kV) and 69-KV switchyard;
- a deaerating surface condenser;
- an on-site fuel gas compressor station; and
- zero-liquid discharge (ZLD) system.

The WEC would also include the following linear ancillary projects:

- approximately 1,950 feet of 115-kV electrical transmission line;
- approximately 670 feet of 69-kV electrical transmission line;
- approximately 3.6 miles, 8-inch natural gas supply pipeline;
- approximately 1.6 miles, 12 to 24 inch recycled water supply pipeline; and
- approximately 0.9 miles of potable water supply pipeline.

Construction activities for the WEC, both on-site and off-site, would generate air emissions from earth moving activities and construction equipment. Construction is expected to last approximately 22 months with the highest daily emissions being forecast to occur during the seventh month of construction. Off-site construction of the natural gas pipeline and recycle water pipeline is expected to last 12 months. Construction of the new transmission line interconnects are expected to last one month. (TID 2002a, Appendix 8.1D, page 2).

Project Site

The power plant alone would take approximately 22 months to construct. The power plant project construction consists of five main phases: 1) site preparation, 2) foundation work, 3) installation of major equipment, 4) construction/installation of major structures; and 5) startup and commissioning. Fugitive dust emissions during the construction of the project result from dust entrained during site preparation and grading/excavation at the construction site, during onsite travel on paved and unpaved surfaces, and during aggregate and soil loading and unloading operations, as well as wind erosion of areas disturbed during construction activities. The largest fugitive dust emissions are generated during site preparation activities, where work such as clearing, grading, excavation of footings and foundations, and backfilling operations occur. These types of activities require the use of large earth moving equipment, which generate combustion emissions, along with creating fugitive dust emissions. Combustion emissions during the construction of the project result from exhaust sources, including diesel construction equipment used for site preparation, water trucks used to control dust emissions, diesel-powered welding machines, electric generators, air compressors, water pumps, diesel trucks used for deliveries, and automobiles and trucks used by workers to commute to and from the construction site.

Applicant estimates for the highest emissions during construction, based on the seventh month, are shown in **AIR QUALITY Table 10**. Annual on-site construction heavy equipment exhaust and fugitive dust emissions based on the average equipment mix during the 22-month construction period are summarized in **AIR QUALITY Table 11**.

AIR QUALITY Table 10
Maximum Daily Emissions During On-Site Construction
(Month 7; Maximum Emissions), lbs/day

	NO_x	CO	VOC	SO_x	PM_{10}
On-Site					
Construction Equipment	136.13	64.92	10.69	0.12 [a]	6.36
Fugitive Dust	---	---	---	---	32.26
Off-site					
Worker Travel	31.71	379.11	30.27	0.02	0.64
Truck Deliveries	19.61	12.27	1.76	0.81	1.10
Total Emissions	187.45	456.30	42.72	0.95	40.36

From Data Response, Set 2A (TID 2003c) Attachment AQ-105, Table 8.1D-1 and Attachment 8.1D-1 (details) revised 4/8/03.
Notes:
a. Heavy diesel construction equipment emission factors are based on equipment meeting or exceeding EPA 1996 off-road diesel standards and use of CARB ultra low-sulfur fuel (15 ppm sulfur).

AIR QUALITY Table 11
Average Annual Emissions During On-Site Construction, tons/year

	NO_x	CO	VOC	SO_x	PM_{10}
On-Site					
Construction Equipment	10.42	7.26	1.10	0.01	0.67
Fugitive Dust	---	---	---	---	1.08
Off-site					
Worker Travel	3.96	47.39	3.78	0.00	0.08
Truck Deliveries	2.55	1.60	0.23	0.11	0.14
Total Emissions	16.93	56.25	5.11	0.12	1.98

From Data Response, Set 2A (TID 2003c), Attachment AQ-105, Table 8.1D-2 and Attachment 8.1D-1 (details) revised 4/8/03.

Staff does not agree with the applicant's fugitive dust control methodology and calculations. Staff has determined that the assumptions used by the applicant to estimate the construction emissions are inconsistent with the level of mitigation that they have proposed. In particular, the assumed tailpipe emissions from the construction equipment are too low, considering the proposed mitigation. For modeling purposes, staff has revised the emission analysis to be consistent with the proposed mitigation and reasonable control assumptions. Staff's construction emission calculations and emissions estimate are provided in **AIR QUALITY ATTACHMENT A.** This attachment details the differences in the staff's and applicant's calculation methods and provides rationale for staff's revised emissions assumptions.

Linear Facilities

The linear facilities would include the natural gas pipeline, recycled water supply pipeline and the 115- and 69-kV transmission lines. The construction of all linear facilities is expected to last no longer than 12 months.

The natural gas pipeline would connect to the Pacific Gas & Electric Company's (PG&E's) existing main pipeline (Line 215) located approximately 3.6 miles south of the project site at West Bradbury Road. The pipeline would run north from West Bradbury Road adjacent to South Commons Road for approximately 2.7 miles, then east on the south side of the railroad tracks for another 0.9 miles to the project site. Open trench construction would be performed in approximately 500-foot long sections over a short

duration to minimize fugitive dust and construction equipment combustion emissions. Open trench construction would be used for crossing irrigation canals, if the canal is dry and can be taken out of service. Otherwise, either horizontal directional drilling or "jack-and-bore" drilling would be used.

The recycled water supply pipeline would use up to 1,800 acre feet per year (afy) of recycled water from the City of Turlock's Wastewater Treatment Plant (WWTP), located approximately 1.6 miles from the project site. The pipeline would be routed from the project site south to Ruble Road (1,100 feet), along the east side of the 69-acre parcel, then east on Ruble Road (3,350 feet) to South Tegner Road, and then proceed south (1,100 feet) to an existing 69-kV TID transmission line corridor. The pipeline would then turn east, paralleling the transmission line (2,600 feet) to South Kilroy Road, then proceed south on South Kilroy Road (350 feet), and finally east to the City of Turlock's WWTP.

The potable water supply pipeline would connect to an existing City of Turlock water main located near the intersection of South Tegner Road and Ruble Road. The pipeline would be installed in the Ruble Road right-of-way, along with the recycled water supply pipeline, and proceed east from the project site to South Tegner Road. The emissions from the potable water line construction are included with the recycled water line emissions in the "water pipeline" construction emission estimates.

The 115-kV transmission line would be approximately 1,950 feet long and would interconnect from the project site to the existing TID Walnut Hilmar 115-kV transmission line, which runs along the west side of South Washington Road. The 115-kV transmission line interconnection would involve the construction of one double-circuit transmission line on one set of poles. The proposed 115-kV connection would align in an east/west direction and cross open farmland, along an existing electrical easement, adjacent to the Tidewater Southern (owned by Union Pacific Railroad).

The 69-kV transmission line would be approximately 670 feet long and would interconnect from the project site to the existing TID Walnut Industrial 69-kV transmission line, which runs along the south property line of the project parcel. The 69-kV transmission line would also be a double-circuit transmission line on one set of poles. The proposed 69-kV connection would align in a north/south direction and cross open farmland.

AIR QUALITY Table 12 shows maximum daily emissions expected from the construction of the natural gas pipeline, recycled water supply pipeline and the transmission line interconnect.

AIR QUALITY Table 12
Maximum Daily Emissions During Pipeline and Transmission Line Interconnect Construction, lbs/day

	NO_x	CO	VOC	SO_x	PM_{10}
Natural Gas Pipeline					
On-Site					
Construction Equipment	55.81	17.93	4.14	1.89	2.77
Fugitive Dust	---	---	---	---	4.66
Off-site					
Truck Deliveries	18.56	11.61	1.67	0.77	1.04
Worker Travel	3.71	44.38	3.54	0.00	0.08
Total Emissions	78.08	73.92	9.35	2.66	8.55
Water Pipeline					
On-Site					
Construction Equipment	61.98	22.61	4.85	2.22	3.17
Fugitive Dust	---	---	---	---	5.47
Off-site					
Truck Deliveries	27.84	17.42	2.50	1.15	1.56
Worker Travel	3.71	44.38	3.54	0.00	0.08
Total Emissions	93.53	84.41	10.89	3.37	10.28
Transmission Line Interconnect					
On-Site					
Construction Equipment	76.13	15.58	4.83	2.20	3.47
Fugitive Dust	---	---	---	---	1.14
Off-site					
Truck Deliveries	46.40	29.03	4.17	1.92	2.61
Worker Travel	3.09	36.99	2.95	0.00	0.06
Total Emissions	125.62	81.59	11.95	4.12	7.28

From Data Response, Set 1B (TID 2003a) Table 8.1D-3R (2/18/03) and Table 8.1D-1R (worker travel details), and AFC (TID 2002a) Attachment 8.1D-1 (truck delivery details).

OPERATIONAL PHASE

Equipment Description

The equipment for the proposed WEC would include the following components:

- two General Electric Frame 7EA (or equivalent) combustion turbine generators (CTGs), each rated at 84 MW (nominal at site design conditions). Each CTG would be equipped with dry, low-NO_x combustors;
- two unfired heat recovery steam generators (HRSG),
- one 100-MW (nominal) condensing steam turbine generator (STG);
- a continuous emission monitoring (CEM) system for NO_x, CO, and oxygen;
- deaerating five surface condenser;
- -a five cell mechanical draft cooling tower using recycled water from the City of Turlock's Regional Wastewater Treatment Plant (WWTP);
- one 300-hp diesel fire pump; and

- two 100-percent capacity or three 50-percent capacity electric motor-driven fuel gas compressors.

Facility Operation

TID has proposed to develop the WEC within a 69-acre parcel located in an industrial area about four miles west of downtown Turlock in Stanislaus County, California. The project site is located adjacent to the Foster Farm's Foster Commodities-West Main plant, southeast of the intersection of West Main Street and South Washington Road. The power plant would be accessed via a new 1,900-foot road running from South Washington Road through the west side of the project parcel. The power plant and switchyard site would occupy approximately 16 acres near the northeast corner of the 69-acre parcel. An additional two acres would be needed for primary access and emergency access to the plant and transmission lines. The remaining 51 acres would be available for lease as agricultural land or future development after construction is completed.

The WEC would use two stationary, natural gas-fired combustion turbines for power production. Each CTG would generate an average of 84 MW at base load under average ambient conditions. Each CTG would feature dry low-NO_x combustors for emission control. The CTG exhaust gases would be used to generate steam in two unfired HRSGs. The HRSGs would be a reheat design with no duct firing. Each HRSG would be equipped with a selective catalytic reduction (SCR) emission control system that uses ammonia vapor in the presence of a catalyst to reduce the NO_x concentration in the exhaust gases. An oxidation catalyst would also be installed in the HRSGs to control CO and VOC emissions. Steam from the HRSGs would be routed to a condensing STG, which would produce approximately 100 MW when the CTGs are operating at base load at average ambient conditions. The total net generating capacity of the power plant would be 250 MW with an overall annual availability of 92 to 98 percent.

Accessories for each CTG include inlet air filters and evaporative coolers, double lube oil cooler, compressor wash system, fire detection and protection system, dry low NO_x combustion system, and acoustical enclosures. The major components for each HRSG include a feedwater preheater, low-pressure (LP) economizer, LP drum, LP evaporator, LP superheater, intermediate-pressure (IP) economizer, IP evaporator, IP superheaters/reheaters, high-pressure (HP) economizers, HP evaporator, HP drum, and HP superheaters. The steam turbine system includes a condensing STG with reheat, gland steam system, lubricating oil system, hydraulic control system, and steam admission/induction valving.

The WEC design includes a five-cell mechanical draft cooling tower using recycled water provided by the City of Turlock's Waste Water Treatment Plant (WWTP). Cooling tower blowdown would be discharged to a zero-liquid discharge (ZLD) treatment system that would in part be used to provide the steam cycle makeup water for the WEC.

The City of Turlock is currently developing a Title 22 Tertiary Wastewater Treatment Plant, which is required by the Regional Water Quality Control Board (RWQCB) to be online by May 2006. The schedule for the WEC project shows operations beginning the

fourth quarter of 2005. Therefore, TID proposes to use potable water from the City of Turlock to meet the project's water demands until the City's recycled water is available.

The facility would be operated seven days a week, 24 hours per day. The project is expected to have an annual plant availability of 92 to 98 percent. However, the exact operational profile of the plant cannot be defined in detail since operation of the facility depends on varying hydroelectric power availability and variable demand in the TID service area. The facility could be operated in one or all of the following modes: (1) base load – operated at maximum continuous output; (2) load following – operated between maximum continuous output and minimum load to meet TID's system demands; (3) daily cycling – operated up to maximum continuous output during the day and totally shut down at night or weekends; and (4) full shutdown due to equipment malfunction, fuel supply interruption, transmission line disconnect, or scheduled maintenance.

Emission Controls

The exclusive use of pipeline-quality natural gas, a relatively clean-burning fuel, would limit the formation of VOC, PM_{10}, and SO_2 emissions. Natural gas contains very little noncombustible gas or solid residues and a small amount of reduced sulfur compounds, including mercaptan. Additionally, there would be no distillate fuel oil firing at WEC, except in the fire pump engine.

Each CTG would be equipped with a dry low NO_x combustion system to control NO_x and VOC concentrations in the exhaust gas. Dry low NO_x combustors would generate approximately 9 parts per million by volume, dry (ppmvd) NO_x at 15 percent oxygen (O_2) and VOCs at or below 1.4 ppmvd at actual stack oxygen concentrations (TID 2002a, page 8.1-59 to 60). Post-combustion NO_x control would be provided using a selective catalytic reduction (SCR) system. The SCR system will use aqueous ammonia to further reduce NO_x emissions to 2.0 ppmvd at 15 percent O_2 on a one-hour average basis, with up to 10 hours per year of excursions (during transient load conditions) up to a level of 25 ppmvd at 15 percent O_2 (TID 2003a, DRR #20). Ammonia slip would be limited to 10 ppmvd at 15 percent O_2 from the gas turbines/HRSGs (TID 2002a, page 8.1-39). CO would be controlled at the CTG combustor and by an oxidation catalyst, and would be limited to no greater than 4 ppmvd at 15 percent O_2 (excluding startups and shutdowns). Although the turbines/HRSGs will be equipped with oxidation catalysts, no VOC control effectiveness has been assumed by the applicant (TID 2002a, page 8.1-60, Note 11). Particulate emissions would be controlled using natural gas as the sole fuel for the CTGs.

Particulate emissions from the cooling tower would be controlled using high-efficiency drift eliminators with an emission control rate of 0.0005 percent.

Diesel fire pump NO_x emissions would be limited through the use of a turbocharged and timing retarded engine achieving 5.2 grams NO_x per horsepower-hour (hp-hr) at full load. Particulate emissions from the diesel fire pump would be reduced to less than 0.1 grams/hp-hr through the use of low-sulfur diesel.

Two 132-foot-tall, 16-foot diameter stacks would release the HRSG exhaust gas into the atmosphere. Continuous emission monitors (CEMs) would be installed on the two

HRSG stacks to monitor NO_x, CO, and oxygen concentrations to assure adherence with the proposed emission limits. The CEM system would generate reports of emissions data in accordance with permit requirements and send alarm signals to the plant's control room when the level of emissions approaches or exceeds pre-selected limits.

Project Operating Emissions

Air emissions would be generated from operating the major project components. The emission rates for the combustion gas turbines, cooling tower, and diesel fire pump are provided in **AIR QUALITY Table 13.**

AIR QUALITY Table 13
Maximum Pollutant Emission Rates, lb/hr

Pollutant	Each Gas Turbine [a]	Annual Average Each Gas Turbine [b]	Cooling Tower	Diesel Fire Pump
NO_x	7.59	7.18	---	3.44
CO	9.25	8.74	---	0.18
VOC	1.84	1.74	---	0.10
PM_{10}	7.00	7.00	1.29	0.06
SO_2	1.05 [c]	0.99	---	0.10 [d]
NH_3	14.06	13.28	39.2 [e]	---

From Data Adequacy (TID 2002b) Revised Table 8.1A-6R and AFC (TID 2002a) Tables 8.1-15, 8.1A-1, 8.1A-2, and 8.1A-3.
Note(s):
a. Estimated at 32°F, 90% humidity and 100% load (Case 5 - Cold Base).
b. Annual average rates used for determining annual emissions for offset requirements estimated at 61°F, 59% relative humidity and 100% load (Case 3 – Avg Base).
c. Gas Turbine SO_2 emissions are based on fuel sulfur content of 0.36 grains/100 scf, which is a conservative estimate based on hourly sulfur measurements taken at the PG&E Burney Compressor Station for the period December 18, 2000 through December 17, 2001 (TID 2003a, DRR #9, Attachment AQ-9).
d. Fire Pump SO_2 emissions are based on fuel sulfur content of 0.05% (500 ppm).
e. Staff estimate based on mass balance. It is assumed that for this project, considering the use of the ZLD system, all incoming ammonia from the recycled water will be emitted. The emission estimate assumed 56 ppm ammonia in the incoming recycled water and a maximum hourly incoming rate of 83,333 gallons.

Expected event emission rates during startup and shutdown events are summarized in **AIR QUALITY Table 14**.

Air Quality Table 14
WEC Facility Criteria Pollutant Emission Rates
During Startup and Shutdown

Pollutant	Maximum, lb/hr [a]	Maximum, lb/start	Annual Average, lb/hr [b]
NO_x (Cold / Hot Start)	119 / 83	300 / 114	60
CO (Cold / Hot Start)	129 / 113	383 / 160	129
VOC	16	48 / 48	16

From Data Adequacy (TID 2002b) Revised Table 8.1A-6R and AFC (TID 2002a) Tables 8.1A-5 and 8.1-17.
Note(s):
a. Estimated based on vendor data provided in AFC Table 8.1A-5. Estimated time is 5 hours for a cold start and 2 hours for a hot start.
b. Revised annual emissions from Data Adequacy Revised Table 8.1A-6R. Estimated startup/shutdown time is 296 hours per year, with an expected downtime of 8 hours per 2-hour hot start-up sequence.
c. Emissions for pollutants not shown here during startups and shutdowns are assumed to be equal to the maximum hourly emissions during baseload facility operation.

AIR QUALITY Table 15 summarizes the maximum (worst-case) estimated levels of the different criteria pollutants from the turbine, fire pump engine and cooling tower. To assess worst-case hourly emissions, the following assumptions were made:

Maximum Hourly Emissions:

For NO_x, CO and VOC:

- one turbine is in cold startup mode;
- one turbine is operating at full load; and
- fire pump is tested;

For SO_2, PM_{10} and NH_3:

- two turbines operate at full load;
- fire pump is tested; and
- cooling tower operates at maximum output.

Air Quality Table 15
WEC Worst-Case Hourly Emissions

	Maximum Hourly, lb/hr					
	NO_x	**SO_2**	**CO**	**VOC**	**PM_{10}**	**NH_3**
Turbines (2)	126.6	2.1	138.3	17.8	14.0	28.1
Fire Pump Engine	3.44	0.1	0.18	0.1	0.06	---
Cooling Tower	---	---	---	---	1.29	39.2 [a]
Total	130.0	2.2	138.4	17.9	15.4	67.3

From Data Adequacy (TID 2002b) Table 8.1-18 and 8.1A-6R, revised.
Note:
a. Staff estimate – see Air Quality Table 14.

AIR QUALITY Table 16 summarizes the maximum (worst-case) estimated levels of the different criteria pollutants from the turbine, fire pump engine and cooling tower. To assess worst-case daily emissions, the following assumptions were made:

Maximum Daily Emissions:

For NO_x, CO and VOC:

- each turbine operates in startup mode for a five-hour cold start;
- each turbine operates at full load for 19 hours; and
- fire pump is tested (one-hour).

For SO_2, PM_{10} and NH_3:

- each turbine operates at full load for 24 hours;
- fire pump is tested (one-hour); and
- cooling tower operates at maximum output for 24 hours.

Air Quality Table 16
WEC Worst-Case Daily Emissions

	Maximum Daily, lb/day					
	NO_x	SO_2	CO	VOC	PM_{10}	NH_3
Turbines (2)	888.6	50.3	1,117.4	165.7	336.0	674.9
Fire Pump Engine	3.4	0.1	0.18	0.1	0.06	---
Cooling Tower	---	---	---	---	30.9	940 [a]
Total	892.0	50.4	1,117.6	165.8	366.9	1,614.9

From Data Adequacy (TID 2002b) Table 8.1-18 and 8.1A-6R, revised.
Note:
a. Staff estimate based on mass balance. It is assumed that for this project, considering the use of the ZLD system, all incoming ammonia from the recycled water will be emitted. The emission estimate assumed 56 ppm ammonia in the incoming recycled water and a maximum daily incoming rate of 2,000,000 gallons.

AIR QUALITY Table 17 summarizes the annual estimated levels of the different criteria pollutants from the turbine, fire pump engine and cooling tower. To assess the annual emissions, the following assumptions were made:

Annual Emissions:

For NO_x, CO and VOC:

- each turbine operates in startup or shutdown mode for 296 hours per year (annual average rates);
- each turbine operates at full load for 7,280 hours per year (annual average rates); and
- fire pump engine operates for 100 hours per year.

For SO_2 and PM_{10} and NH_3:

- each turbine operates at full load for 8,760 hours per year;
- fire pump engine operates for 100 hours per year; and
- cooling tower operates at maximum output for 8,760 hours per year.

Air Quality Table 17
WEC Annual Emissions

	Maximum Annual, tons/year					
	NO_x	SO_2	CO	VOC	PM_{10}	NH_3
Turbines (2) [a]	70.0	8.7	100 [b]	17.4	61.3	116.3
Fire Pump Engine	0.2	0.005	0.009	0.005	0.003	---
Cooling Tower	---	---	---	---	5.6	137.8 [c]
Total	70.2	8.7	100 [b]	17.4	67.0	254.1

From Data Adequacy (TID 2002b) Table 8.1-18 and 8.1A-6R, revised.
a. Turbines emissions are based on annual average rates provided in Data Adequacy Table 8.1A-6R, revised.

b. Project CO emissions are estimated to be 101.7 tons/year, however the Applicant will limit CO emissions to less than 100 tons per year. Compliance will be achieved by one or more of the following methods (TID 2003a, DRR #16): (1) over compliance with the 4.0 ppm CO emissions limit, (2) over compliance with the proposed CO startup emission rates, (3) operation at less than full load for some fraction of the year, and/or (4) operation for slightly less than the maximum permitted number of operating hours.

Staff estimate based on mass balance. It is assumed that for this project, considering the use of the ZLD system, all incoming ammonia from the recycled

water will be emitted. The emission estimate assumed 56 ppm ammonia in the incoming recycled water and a maximum annual incoming rate of 1800 acre-feet.

The proposed WEC project is considered by the District to be a modification to the existing Walnut Peaking Power Plant (WPPP), which is located on an adjacent property to the west of the WEC project site. The District assumes this to be the case because the two facilities are on adjacent properties owned by the same entity. This assumption is used for determination of New Source Review requirements, in particular offset requirements as later described in yhr impsvyd mitigation section. The total combined emissions from the existing WPPP and the WEC are summarized in **AIR QUALITY Table 18**.

Air Quality Table 18
Total Annual Emissions

	Maximum Annual, tons/year					
	NO_x	**SO_2**	**CO**	**VOC**	**PM_{10}**	**NH_3**
Walnut Peaking PP	47.5	15.8	100	13.2	7.0 [a]	---
Walnut Energy Center	70.2	8.7	100	17.4	67.0	254.1
Total	117.7	24.5	200	30.5	74.0	254.1

From Data Adequacy (TID 2002b) Table 8.1-28, page 8.1-60, Table 8.1A-6R (details), and PDOC (SJVAPCD 2003a) for Walnut Peaking Power Plant VOC emissions, page 24.
Note(s):
NA = Not Available
a. Walnut Peaking Power Plant emissions, except for PM_{10} (originally 35,080 lb/yr or 17.54 tons/yr), are based on District permit evaluation data and 877 hours per year of operation for each turbine. PM_{10} offset requirements will be fully met by limiting the two existing peaker turbines to 8 lb/hr PM_{10} and 877 hours/year of operation (877 hr/yr x 2 turbines x 8 lb/hr PM_{10} = 14,032 lb/yr or 7.02 tons/yr).

INITIAL COMMISSIONING

The initial commissioning of a power plant refers to the time frame between the completion of the construction and the reliable production of electricity for sale on the market. For most power plants, operating emission limits usually do not apply during the initial commissioning procedures.

Commissioning activities for the WEC CTG/HRSGs are expected to last approximately 300 hours per turbine. As a possible worst case, commissioning activities are assumed to occur with one turbine being commissioned while the other turbine operates at full load and maximum permitted emission rates (TID 2003b, DRR #18). Prior to commissioning the CTG/HRSGs, continuous emissions monitoring (CEM) systems would be installed and operating, however they will not be certified (TID 2003b, DRR #17), to measure criteria pollutants during commissioning.

The range of commissioning tests for each CTG/HRSG at the WEC includes the following: 1) full speed no load tests; 2) partial (50 percent) load test; 3) full load test with no SCR; 4) full load test with partial SCR; 5) full load test with full SCR; and 6) hot startup testing. The applicant has estimated the initial commissioning emissions in **AIR QUALITY Table 19**.

AIR QUALITY Table 19
Turbine/HRSG Commissioning Emissions

Commissioning Activities	Operation Duration [a]	Fuel Use [b]	NO_x	CO	VOC	PM_{10}	SO_x
(per CTG/HRSG)	(Hours)	(MMBtu/h, HHV)	Hourly Emissions, lb/hr				
Full Speed, No Load Test	72	300	108.82	180.0	17.0	7.0	0.30
50% Load Test	144	620	56.23	210.0	16.0	7.0	0.62
Full Load Test, No SCR	48	944.7	51.40	20.87	1.67	7.0	0.94
Full Load Test, Partial SCR	24	944.7	29.13	8.34	1.67	7.0	0.94
Full Load Test, Full SCR	288	944.7	6.85	8.34	1.67	7.0	0.94
Hot Starts	6	---	83.00	113.0	16.0	7.0	1.05
Total (2 CTG/HRSGs)	1,164	---	43,138	94,965	8,452	8,148	915

From Data Response, Set 1D (WEC 2003b) DRR #17, Attachment AQ-17.
Note(s):
a. Maximum operating hours assume turbines operate 24 hours per day during all commissioning days.
b. Fuel Use: No load test based on 20% load operation; 50% load test based on 50% fuel use for a 7EA CTG at 32°F, Full load test based on baseload fuel use for a 7EA CTG at 32°F.

Although Table 20 would suggest that the period of time (1,164 hours) of initial commissioning would seem long, that figure represents the hours for both turbines. Each turbine was estimated to operate approximately 582 hours under initial commissioning; 288 hours of that time would be fully abated with control technology. Unabated emissions would be on the order of about 300 hours per turbine.

PROJECT IMPACTS

MODELING APPROACH

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

The applicant has used the U.S. EPA's Industrial Source Complex (ISC), Short-Term Model (ISCST3, Version 02035), to estimate the impacts of the project's NO_X, PM_{10}, CO and SO_X emissions resulting from project construction and operation. The ISC model is a steady-state Gaussian plume model, appropriate for regulatory use, used to assess pollution concentrations from a wide variety of emission sources.

The applicant has used the SCREEN3 model to determine worst-case one-hour NO_2, CO and SO_2 impacts under fumigation conditions. The SCREEN3 model is a steady-

state Gaussian plume model, appropriate for the screening level modeling of single point sources to assess worst-case impacts.

For one-hour average construction and operating NO_x modeling (turbine startup, turbine commissioning, and emergency diesel engine operation), the Applicant provided a refined modeling analysis using the ozone limiting method (OLM) model (ISC3_OLM, Version 96113). This method calculates the maximum NO to NO_2 conversion rate, using ozone concentration files to determine maximum one-hour NO_2 concentrations, assuming that 10 percent of the tailpipe NO_x is NO_2 and that there is a 100 percent conversion of NO to NO_2 through a chemical reaction with the ozone. This method is somewhat conservative in that it does not consider mixing or ozone consumption limitations in determining maximum NO_2 concentrations. This modeling method is accepted by the USEPA and CARB for one-hour NO_2 modeling. The AFC notes that according to guidance by SJVAPCD, concurrent ozone data collected at Turlock Minaret Street monitoring station were used for the analysis (TID 2002a, page 8.1-50); however, Modesto 14th Street ozone data was actually used by the applicant. Due to the proximity of the two stations, the similarity in the ozone data for these two stations, and the fact that the meteorological data used was from Modesto, staff considers the use of the Modesto ozone data acceptable.

A description of the applicant's modeling analyses is provided in Section 8.1.5.1.2 of the AFC (TID 2002a, pages 8.1-41 to 54) and in the Appendices (TID 2002a, Appendix 8.1B - Modeling Analysis and Appendix 8.1D - Construction Phase Impacts). The applicant utilized hourly meteorological data collected at the Modesto Airport, for the year 1999, as recommended by the SJVAPCD (TID 2002a, page 8.1-43).

Staff remodeled construction impacts using the ISCST3 model (Version 02035) and a simplified ozone limiting method.

CONSTRUCTION IMPACTS

The following section discusses the project's short-term direct construction ambient air quality impacts, as estimated by the applicant and separately estimated by staff.

Applicant Construction Impact Analysis

The applicant modeled the emissions of the WEC onsite construction activities. This analysis was completed using the ISCST3 (Version 02035) model. The exhaust and fugitive dust emissions were modeled as single area sources that covered the total area of the construction site (TID 2002a, Appendix 8.1D, Section 8.1D.5.1). To determine the construction impacts on short-term ambient standards (i.e. one-hour through 24 hours), the worst-case daily onsite construction emission levels shown in **AIR QUALITY Table 10** were used. For pollutants with annual average ambient standards, the annual on-site emissions levels shown in **AIR QUALITY Table 11** were used. Modeling assumed that all of the equipment would operate from 6 am to 6 pm daily. The applicant has determined that noisy construction, however, will be scheduled later in the day to avoid early morning meteorological conditions, thereby lowering emission impacts (TID 2003b, DRR #19). The applicant notes that additional hours for construction may be necessary to make up schedule deficiencies, or to complete critical construction

activities (TID 2002a, page 2-18 to 19). **AIR QUALITY Table 20** provides the results of this modeling analysis.

AIR QUALITY Table 20
WEC Ambient Air Quality Impact
Applicant Construction ISC Modeling Results

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$) [b]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
NO_2 [a]	one-hour	147	180	327	470	CAAQS	70
	Annual	10.5	34.0	44.5	100	NAAQS	45
PM_{10}	24-Hour	46	**148**	**194**	50	CAAQS	**388**
	Annual Geometric	2.9	**33**	**36**	30	CAAQS	**120**
	Annual Arithmetic	2.9	39	41.9	50 [c]	NAAQS	84
CO	one-hour	164	5,730	5,894	23,000	CAAQS	26
	eight-hour	60	4,046	4,106	10,000	CAAQS	41
SO_2	one-hour	0.3	47.2	47.5	655	CAAQS	7
	three-hour	0.3	41.6	41.9	1,300	NAAQS	3
	24-Hour	0.1	23.5	23.6	105	CAAQS	22
	Annual	0.01	5.2	5.2	80	NAAQS	7

From Data Response, Set 1D (TID 2003b), DRR #19, Revised Table 8.1D-4R, and Data Response, Set 2A (TID 2003c) Attachment AQ-105, Table 8.1D-4, revised 4/8/03.
Note(s):
a. one-hour NO_x value was modeled using OLM_ISC. The annual value is multiplied by the Annual NO_x Ratio Method (ARM) EPA default value of 0.75.
b. Background values have been adjusted per staff recommended background concentrations shown in AIR QUALITY Table 9.
c. New state PM_{10} standard of 20 $\mu g/m^3$ approved but not yet effective.

As can be seen from the modeling results provided in **AIR QUALITY Table 20**, the construction PM_{10} (24-hour and annual) impacts exceed the ambient air quality standards and are, therefore, potentially significant. The applicant's construction modeling analysis indicates that the maximum NO_x, CO and SO_2 impacts will remain below the CAAQS and NAAQS

The potential ambient air quality impacts associated with the construction of the natural gas pipeline, recycled water pipeline and the transmission line interconnects are expected to be minimal, since construction would occur for a short duration, require minimal equipment, and would generally occur along public roads and utility right-of-ways over a large geographical area (TID 2002a, Appendix 8.1D, Section 8.1D.5.4). Therefore, these activities were not included in the applicant's construction impact modeling analysis.

Staff Construction Impact Analysis

Staff found several issues relating to the applicant's construction emission estimate and the construction modeling methods, for example, the applicant took credit for mitigation measures they did not actually propose; the unpaved road dust equations were calculated incorrectly; various assumptions used in the emission calculations (such as equipment types) were not used consistently, and the engine emission factors given are not correct based on the source references given. Staff has revised the emission

estimates so that they are consistent with mitigation measures proposed and internally consistent (see **AIR QUALITY ATTACHMENT A**).

Staff performed a construction impact analysis using the revised construction emission estimates. The modeling used a combination of point sources, volume sources, and an area source. The applicant has not proposed an enforceable limit on the hours of construction; therefore, staff modeled the emissions assuming a 24-hour construction schedule in order to determine the worst-case short-term (one-hr, three-hr, eight-hr, and 24-hr) impact potential. The annual emissions were modeled using the worst continuous 12-month period in the emissions estimate. The construction emission and modeling assumptions are provided in **AIR QUALITY ATTACHMENT A**. **AIR QUALITY Tables 21** and **22** provide the results of this modeling analysis.

Air Quality Table 21
WEC Ambient Air Quality Impact
Staff Worst-Case Construction ISC Modeling Results

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$) [b]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
NO_2 [a]	one-hour	263	180	**443**	470	CAAQS	**94**
	Annual	24.5	34.0	58.5	100	NAAQS	59
PM_{10}	24-Hour	122.1	**148**	**270.1**	50	CAAQS	**540**
	Annual	17.3	**33**	**50.3**	30	CAAQS	**168**
CO	one-hour	364	5,730	6,094	23,000	CAAQS	26
	eight-hour	215	4,046	4,261	10,000	CAAQS	43
SO_2	one-hour	11.1	47.2	58.3	655	CAAQS	9
	three-hour	9.7	41.6	51.3	1,300	NAAQS	4
	24-Hour	4.4	23.5	27.9	105	CAAQS	27
	Annual	0.9	5.2	6.1	80	NAAQS	8

Note(s):
a. one-hour NO_x value was modeled using a simplified OLM approach. The annual NO_x value is multiplied by the Annual NO_x Ratio Method (ARM) EPA default value of 0.75.
b. Background values have been adjusted per staff recommended background concentrations shown in Table 9.

Air Quality Table 22
WEC Ambient Air Quality Impact
Staff Construction ISC Modeling Results
7 am to 7 pm Daily Construction Schedule – 24-hour PM10 Impacts

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$) [a]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
PM_{10}	24-Hour	74.8	**148**	**222.8**	50	CAAQS	**446**

Note(s):
a. Background values have been adjusted per staff recommended background concentrations shown in Table 9.

Staff's modeling results would be lower than the applicant's original modeling results (AFC Appendix 8.1D) if the emissions modeled were equal.

As **AIR QUALITY Tables 21 and 22** show, the predicted maximum fence line construction 24-hour and annual PM_{10} concentrations are potentially significant. The

PM_{10} construction impacts decrease very rapidly with distance from the fence line. For the 7 a.m. to 7 p.m. construction schedule, the maximum residential 24-hour and annual impacts are predicted to be approximately 29 ug/m^3 and 4 ug/m^3, respectively, and are predicted to occur at a single residential receptor located approximately 665 feet southeast of the project fence line. The second highest residential impacts were found to be 13 and 0.8 ug/m^3, for 24-hour and annual impacts, respectively.

Staff's construction modeling analysis indicates that the maximum NO_x, CO and SO_2 impacts will remain below the CAAQS and NAAQS; therefore, there are no significant construction impacts expected for these three pollutants. However, this assumes that the NO_x emissions estimated, using the applicant's worst-case equipment mix and Tier 1 NO_x emission factor assumptions, do not significantly underestimate the worst-case hourly NO_x emissions. A significant increase in the NO_x emission from those estimated by the applicant may have the potential to cause modeled exceedances of the one-hour NO_2 CAAQS.

OPERATION IMPACTS

The following section discusses the project's direct ambient air quality impacts, as estimated by the applicant, and evaluated by staff. The applicant performed direct impact modeling analyses, including operations, fumigation, startup, and commissioning impact modeling.

Operational Modeling Analysis

A refined modeling analysis was performed to identify off-site criteria pollutant impacts from operational emissions of the proposed project. The impact modeling analysis included both maximum operating and startup/shutdown scenarios to determine maximum short-term and annual emission impacts. Turbine emission rates were calculated from equipment vendor estimates for six load conditions:

- case 1) Hot Base - 97°F ambient temperature, 100 percent load, with inlet fogging;
- case 2) Hot 50 - 97°F, 50 percent load, no inlet fogging;
- case 3) Avg Base - 61°F, 100 percent load, with inlet fogging;
- case 4) Avg 50 - 61°F, 50 percent load, no inlet fogging;
- case 5) Cold Base - 32°F, 100 percent load, no inlet fogging; and
- case 6) Cold 50 – 32°F, 50 percent load, no inlet fogging.

Fire pump operation will be restricted to 100 hours per year.

The ISCST3 model (Version 02035) was used for the refined modeling analysis. One-hour NO_2 impacts were modeled using ISC3_OLM model (Version 96113). For this refined modeling analysis, the Applicant conducted a Good Engineering Practice (GEP) stack height analysis using the Building Profile Input Program (BPIP) Version 98086, and downwash effects were modeled for the facility using the ISCST3 model. One year of meteorological data (1999) from Modesto Airport was used in the modeling analysis.

The applicant's predicted maximum concentrations of the non-reactive pollutants are summarized in **AIR QUALITY Table 23.**

Air Quality Table 23
WEC Ambient Air Quality Impact
Applicant Operational Impact ISC Modeling Results

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$) [f]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
NO_2	one-hour	8.26 [a]	157	165.3	470	CAAQS	35
	Annual	0.60 [b]	34.0	34.6	100	NAAQS	35
PM_{10}	24-Hour	2.03 [e]	**148**	150.0	50	CAAQS	**300**
	Annual	0.27	**33**	**33.3**	30	CAAQS	**111**
CO [c]	one-hour	10.1	5,730	5,740	23,000	CAAQS	25
	eight-hour	3.16	4,046	4,049	10,000	CAAQS	40
SO_2 [d]	one-hour	1.13	47.2	48.3	655	CAAQS	7
	three-hour	0.50	41.6	42.1	1,300	NAAQS	3
	24-Hour	0.18	23.5	23.7	105	CAAQS	23
	Annual	0.02	5.2	5.2	80	NAAQS	7

From Data Response, Set 2A (TID 2003c) Attachment AQ-109, Tables 8.1-24 and 8.1B-9, revised 4/8/03.
Note(s):
a. Does not include worst-case fire pump impacts. Worst-case one-hour NO_2 impacts from the fire pump, which will be operated for testing purposes only one hour per week, using ISC_OLM with concurrent ozone data from Modesto 14th Street monitoring station would be 258.3 $\mu g/m^3$.
b. Modeled annual NO_x corrected to NO_2 using ARM default value of 0.75.
c. Worst-case one-hour and eight-hour CO impacts from the fire pump during normal testing operations would be 112.6 $\mu g/m^3$ and 14.1 $\mu g/m^3$, respectively.
d. Worst-case one-hour, three-hour, and 24-hour SO_2 impacts from the fire pump during normal testing operations would be 62.6 $\mu g/m^3$, 20.9 $\mu g/m^3$, and 2.6 $\mu g/m^3$, respectively.
e. Worst-case 24-hour PM_{10} impacts from the fire pump during normal testing operations would 1.6 $\mu g/m^3$.
f. Background values have been adjusted per staff recommended background concentrations shown in AIR QUALITY Table 9.

The applicant's modeling results indicate that the project's normal operational impacts would not create violations of NO_2, SO_2 or CO standards, but could further exacerbate violations of the PM_{10} standards. In light of the existing PM_{10} non-attainment status for the project site area, staff considers the modeled impacts to be significant and, therefore, must be mitigated.

Fumigation Modeling Impact Analysis

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

Fumigation conditions are generally only compared to one-hour standards. The applicant analyzed the maximum one-hour, three-hour, and eight-hour air quality

impacts under fumigation conditions from the project turbines, and fire pump using the SCREEN3 model. The results of the analysis, as shown in **AIR QUALITY Table 24**, indicate that the fumigation impacts would not exceed applicable one-hour AAQS.

Air Quality Table 24
Maximum WEC Fumigation Impacts, (µg/m^3)

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3) [c]	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
NO_2	one-hour	3.24 [a]	157	160.2	470	CAAQS	34
CO	one-hour	3.95 [a]	5,730	5,734	23,000	CAAQS	25
	eight-hour	2.43 [b]	4,046	4,048	10,000	CAAQS	40
SO_2	one-hour	0.44 [a]	47.2	47.6	655	CAAQS	7
	three-hour	0.37 [b]	41.6	42.0	1,300	NAAQS	3

From AFC (TID 2002a) Appendix 8.1-B, Table 8.1B-7.
Note(s):
a. Inversion fumigation maxima from Case 6 - Cold 50.
b. Inversion fumigation maxima from Case 4 – Avg 50.
c. Background values have been adjusted per staff recommended background concentrations shown in AIR QUALITY Table 9.

Maximum fumigation impacts for the turbines were predicted to occur about 9 km from the facility. No fumigation was predicted to occur for the fire pump exhaust due to its short stack. The impacts under fumigation conditions are expected to be lower than the maximum concentrations calculated by ISC under downwash conditions.

Startup Modeling Impact Analysis

The applicant modeled facility impacts during the startup of one turbine to evaluate short-term impacts under startup conditions. The second turbine was not included in this modeling analysis. Emissions rates for this scenario were based on available data provided by the turbine manufacturer (TID 2002a, page 8.1-49). Exhaust parameters for the minimum operating load point (50 percent) were used to characterize turbine exhaust during startup, and a maximum one-hour NO_x emissions rate of 119 lb/hr was used. Startup impacts were evaluated for the one-hour averaging period using ISCST3, and used ISC3_OLM for the one-hour NO2 impacts. The results of the startup emissions modeling analysis are shown in **AIR QUALITY Table 25.**

Air Quality Table 25
WEC Ambient Air Quality Impact
Applicant Turbine Startup Worst-Case Short-Term Engine Impact ISC Modeling

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3) [b]	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
NO_2 [a]	one-hour	87.4	180	267.4	470	CAAQS	57
CO	one-hour	115.3	5,730	5,845	23,000	CAAQS	25

From AFC (TID 2002a) Appendix 8.1-B, Table 8.1B-8.
Note(s):
a. Maximum one-hour turbine commissioning concentrations with ISC3_OLM modeling.
b. Background values have been adjusted per staff recommended background concentrations shown in AIR QUALITY Table 9.

The NO_2 modeling assumed an emission rate of 119 lbs/hour with only one turbine in operation. However, it is possible that two turbines could start at the same time, and there are no conditions limiting the facility to one turbine startup at any given time.

Additionally, staff believes the initial NO_2/NO_x ratio used in the model should be higher than the default model value of 0.10. The NO_2/NO_x ratio has been found to increase as the overall NO_x concentration decreases, and a more emission source specific initial NO_2/NO_x ratio can be estimated to be approximately 0.25 under startup or commissioning periods that have NO_x emission concentrations around 30 to 50 ppm (Hung 2001). Therefore, the worst-case one-hour NO_2 impacts would be expected to be somewhat higher than that shown in **Table 25**. However, the worst-case emissions would not cause an exceedance of the one-hour NO_2 standard, even without using ISC3_OLM modeling. Therefore, the modeling results indicate that the startup emissions do not have the potential to cause significant ambient air quality impacts.

Commissioning Modeling Impact Analysis

There are two high-emissions scenarios possible during commissioning. The first would be when the combustor is being tuned prior to the installation of the SCR system and oxidation catalyst. NO_x and CO emissions would be high because the emissions control systems would not be functioning and because the combustor would not be tuned for optimum performance. The second high-emissions scenario for CO and NO_x would occur after the combustor had been tuned, but before completing the installation of the SCR system, when other parts of the turbine operating system are being checked out. This is likely to occur under transient conditions, characterized by minimum load operation (TID 2002a, page 8.1-49).

The applicant estimated NO_x and CO emissions during commissioning to be equivalent to peak instantaneous startup emission rates (175 lb/hr for NO_x and 210 lb/hr for CO). The exhaust parameters for the minimum operating load point (50%) were used to characterize turbine exhaust during commissioning. The applicant modeled the commissioning impacts using ISCST3, assuming one turbine would be commissioned at a time, without including potential steady state, commissioning or startup emissions from the second turbine. The results of the commissioning emissions modeling analysis are shown in **AIR QUALITY Table 26.**

Air Quality Table 26
WEC Ambient Air Quality Impact
Applicant Commissioning Worst-Case Short-Term Engine Impact ISC Modeling

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$) [b]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
NO_2 [a]	one-hour	106.7	180	286.7	470	CAAQS	61
CO	one-hour	187.4	5,730	5,917	23,000	CAAQS	26

From AFC (TID 2002a) Appendix 8.1-B, Table 8.1B-8.
Note(s):
a. Maximum one-hour turbine commissioning concentrations with ISC3_OLM modeling.
b. Background values have been adjusted per staff recommended background concentrations shown in AIR QUALITY Table 9.

The NO_2 modeling assumed an emission rate of 175 lbs/hour with only one turbine in operation. This emission rate is higher than the 108.8 lbs/hour value shown in **AIR Quality Table 19**, which is also the limit given in the PDOC (condition **AQ-70**). However, the maximum emissions limit contained in the district's Preliminary Determination of Compliance (PDOC) for commissioning (for two turbines) is 227.8 lb/hr (condition **AQ-71**), so the worst-case one-hour NO_2 impacts could be somewhat higher

than that shown in **Table 26**. Also, as noted previously, staff believes that the initial NO_2/NO_x ratio for turbines should be higher than 0.10. However, the worst-case emissions would not cause an exceedance of the one-hour NO_2 standard, even without using ISC3_OLM modeling. Therefore, the modeling results indicate that the commissioning emissions do not have the potential to cause significant ambient air quality impacts.

Secondary Pollutant Impacts

The project's gaseous emissions of NO_x, SO_2, VOC and ammonia can contribute to the formation of secondary pollutants, ozone and PM_{10}. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. No regulatory agency models are approved for assessing single source ozone impacts. However, because of the known relationship of NO_x and VOC emissions to ozone formation, it can be said that the emissions of NO_x and VOC from the WEC do have the potential (if left unmitigated) to contribute to higher ozone levels in the region.

Secondary PM_{10} formation is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there are no agency (U.S. EPA or CARB) recommended models or procedures for estimating nitrate or sulfate formation. Nitrogen oxides first react to form nitric acid, which then reacts reversibly with ammonia to form ammonium nitrate. Sulfur oxides first react to form sulfuric acid, which then react irreversibly to form ammonium bisulfate and ammonium sulfate. Because of the known relationship of NO_x and SO_2 emissions to secondary PM_{10} formation, these emissions, if left unmitigated, will to contribute to higher PM_{10} levels in the region.

The ammonia emissions from the project would come from the SCR system, which controls the NO_x emissions, as unreacted ammonia, or "ammonia slip," that remains in the exhaust after passing through the SCR catalyst system; and from the cooling tower exhaust due to the ammonia in the reclaimed water used in the cooling tower. The San Joaquin Valley, as a result of agricultural ammonia emissions, is noted to be ammonia rich, meaning that ammonia is not the limiting reactant for secondary PM_{10} formation (i.e. the emission inventory indicates that there is more ammonia available in the ambient air than the acid gas reactants, such as nitric acid from NO_x and sulfuric acid from SO_x needed to react with ammonia to form secondary particulate. Research (Watson 1998) has shown that in an ammonia rich area, a reduction of 50 percent ammonia will reduce 15 percent of fine particulate matter, equivalent to a 30 percent conversion rate for ammonia. Thus, if WEC maintains an emission rate of 675 lbs/day of ammonia (based on the applicant's proposed 10 ppm ammonia slip level) the equivalent secondary particulate (nitrates and sulfates) could be in the range of 900 to 1,600 lbs/day. This amount of secondary particulate is approximately two to four times as large as the project's proposed particulate matter emissions, and this does not include the additional ammonia emissions potential from the cooling tower.

Additionally, the higher the ammonia slip, the more likely there will be the formation of ammonium sulfates in the flue gas prior to exhaust. The ammonium sulfate will

contribute to the PM_{10} emissions in the exhaust, and ammonium bisulfate can deposit and cause reduced SCR performance (i.e. catalyst blinding). The negative effects of ammonium bisulfate formation are greatly lessened by the use of natural gas with its inherently low sulfur concentrations, but may still be a minor issue due to the project's relatively low exhaust temperatures. Therefore, controlling the ammonia slip will potentially lessen the particulate emissions from the stack and lower the potential for ammonium bisulfate catalyst blinding.

The applicant is proposing to mitigate the project's NO_x and VOC emissions through the use of emission offsets. The NO_x and VOC offsets, even considering the District's offset thresholds and exempt emission sources, would be provided at greater than a 1:1 ratio. The applicant is not currently proposing to mitigate the project's SO_2 emissions. Staff believes that all nonattainment pollutants and their precursors should be offset at a minimum 1:1 ratio so that the project does not worsen existing violations of ambient air quality standards. PM_{10} is a serious nonattainment pollutant within the San Joaquin Valley Air Basin. Therefore, staff recommends that SO_2 offsets be required at a 1:1 ratio to mitigate the project's secondary particulate formation potential.

With the recommended additional SO_2 offsets and the 5 ppm ammonia emission limits, it is staff's belief that the project will not cause significant secondary pollutant impacts.

Odor Assessment

No odor impact is anticipated from the operation of the main power facilities, as no significant emissions of odorous compounds would result from the gas turbines, cooling tower, natural gas compressors, or emergency equipment exhausts under normal operations. The odor threshold for ammonia is approximately 5 to 10 ppm, and the stack emissions of ammonia for the gas turbine exhaust is recommended to be limited to 5 ppm on a 24-hour basis. The ammonia emissions from the cooling tower would be well below 5 ppm at the point of exhaust. There is the potential for somewhat higher short-term ammonia emission concentrations (i.e. concentration spikes), particularly during startup, shutdown or during load swings. However, after dispersion, the maximum ammonia concentrations at ground level would be well below the odor threshold. Please see the **HAZARDOUS MATERIAL MANAGEMENT** section for further discussion of the consequence analysis of ammonia storage and handling accidents.

MITIGATION

Construction Mitigation

As described in the applicable LORS section, District Regulation VIII (i.e. Series 8000) limits fugitive dust during the construction phase of a project. Staff recommends that construction emission impacts be mitigated to the greatest feasible extent including all feasible measures from the LORS, as well as other measures considered necessary by staff to fully mitigate the construction emissions.

Applicant's Proposed Mitigation

The applicant proposes to implement the following measures to reduce emissions during construction activities (TID 2002a, Appendix 8.1D). The applicant's PM_{10}

emissions estimates in **AIR QUALITY Tables 10** to **12** and construction modeling results in **AIR QUALITY Table 20** assume the use of these emission control measures, and also assumes the use of other measures that have not been proposed by the applicant (see **AIR QUALITY ATTACHMENT A**).

To control exhaust emissions from heavy diesel construction equipment:

- limit engine idling time and shutdown equipment when not in use (a specific time limit was not provided);
- perform regular preventative maintenance to reduce engine problems;
- use CARB low-sulfur and low aromatic fuel for all heavy construction equipment; and
- use low-emitting diesel engines meeting EPA emission standards for construction equipment, if available.

To control fugitive dust emissions:

- use water application or chemical dust suppressant on unpaved travel surfaces and unpaved parking areas;
- use vacuum sweeping or water flushing on paved travel surfaces and parking areas;
- require all trucks hauling loose material to cover the contents or maintain a minimum of two feet of freeboard;
- limit traffic speed on unpaved roads to 25 miles-per-hour (mph);
- install sandbags or other erosion control measures;
- re-plant vegetation in disturbed areas as soon as possible;
- use gravel pads and wheel washers or wash truck tires leaving the construction site as needed; and
- use wind breaks and/or water or chemical dust suppressant to control wind erosion from disturbed areas.

Adequacy of Proposed Mitigation

The applicant's proposed mitigation was included in the modeling analysis as summarized in **AIR QUALITY Tables 21** to **23**. The applicant's revised PM_{10} emission estimate assumes a very aggressive control efficiency factor for fugitive dust (88 percent) from unpaved roads, which staff believes to be overly optimistic considering the mitigation measures and equipment assumed by the applicant (see **AIR QUALITY ATTACHMENT A**). Further, the low PM_{10} emission factor assumed for large diesel construction equipment cannot be supported by the mitigation measures proposed. However, even if the emission and modeling analyses performed by the applicant were assumed to be reasonably accurate, the modeling analysis shows that the mitigated construction PM_{10} impacts are predicted to be potentially significant. Therefore, the applicant's proposed mitigation is not considered adequate.

The maximum 24-hour PM_{10} impacts occur along the southeast fence line of the proposed project site and decrease rapidly with distance from the proposed project site.

The direction of maximum impact corresponds to the prevalent annual wind direction (to the southeast). The maximum residential 24-hour PM_{10} construction impact concentration, considering a reasonable limitation to the construction schedule, was determined to be approximately 29 ug/m^3.

Staff believes that additional construction mitigation measures are needed to mitigate the potentially significant construction PM_{10} impacts, and to assure that the NO_x emissions and impacts are not substantially greater than estimated.

Staff Proposed Mitigation

Staff recommends construction PM_{10} and NO_x emission mitigation measures that include some of the mitigation measures proposed by the applicant, and several additional construction PM_{10} emission mitigation measures and compliance assurance measures in Conditions of Certification **AQ-C1** through **AQ-C4**.

Staff recommends **AQ-C1** to require the applicant to have an on-site construction mitigation manager who will be responsible for the implementation and compliance of the construction mitigation program. The documentation of the ongoing implementation and compliance with the construction mitigation program would be provided in the monthly construction compliance report that is required in staff's recommended Condition of Certification **AQ-C2**.

Staff recommends fugitive dust and diesel engine mitigation measures be provided in Condition of Certification **AQ-C3**. **AQ-C3** includes revisions to, or additions to, the construction emission mitigation measures proposed by the applicant; including the following:

- use of gravel in high traffic areas and the construction laydown area;
- covering and treatment of soil stockpiles;
- use of paved access aprons;
- limit traffic speed to 10 mph;
- suspension of all earth moving activities under windy (i.e. sustained winds >25 mph) conditions;
- restrict idle time, to the extent practical, to no more than 10 minutes;
- incorporation of SJVAPCD fugitive dust regulation requirements;
- use of ultra-low sulfur content diesel fuel;
- use of diesel engines that meet EPA Tier I EPA certified standards, or better, for off-road equipment; and
- use of catalyzed particulate filters (soot filters) on diesel engines, greater than 50 hp, that do not have Tier 1 standards (50 to 175 hp) and that do not meet Tier II particulate standards.

Staff recommends Conditions of Certification **AQ-C4** to limit visible emissions from construction activities at the construction sites, and limit the project related construction visible emissions from occurring within 100 feet of occupied structures.

Staff believes that the construction air quality impacts will be less than significant with the implementation of the mitigation measures contained in the recommended Conditions of Certification.

It was previously contended by the applicant in the San Joaquin Valley Energy Center case that staff's fugitive dust requirements are unnecessary in the San Joaquin Valley considering the District's fugitive dust rules and regulations, which are incorporated as Conditions of Certification **AQ-102** through **AQ-108**. However, the Energy Commission is the lead agency under CEQA for this project and, in that capacity, has the responsibility to ensure that significant impacts are mitigated to a level below significance. The District's rules cited in Conditions of Certification **AQ-102** through **AQ-108** do not require construction exhaust controls, and staff interprets the District's fugitive dust regulations to be "nuisance based" regulations rather than being health protective. Staff contends that its more stringent mitigation measures are necessary in the San Joaquin Valley based on this air basin's poor ambient air quality. The San Joaquin Valley is one of only a few areas in the country classified as a serious PM_{10} nonattainment area. Therefore, it is necessary to implement all feasible PM_{10} emission mitigation measures for projects within the San Joaquin Valley in order to lessen, to the greatest extent possible, construction-related impacts that would only worsen the unhealthful air quality surrounding the project site.

Operations Mitigation

Applicant's Proposed Mitigation

Emission Controls

As discussed in the project description section, the applicant proposes to employ dry low NO_x (DLN) combustors, SCR with ammonia injection, an oxidation catalyst, inlet fogging, and operate exclusively on pipeline quality natural gas to limit turbine emission levels. The AFC (TID 2002a, Table 8.1-15 and Table 8.1A-1), Data Adequacy Supplement (TID 2002b, Table 8.1A-6R, revised 12/12/02), and Data Response, Set 1B (TID 2003a, DRR #20) provide the following BACT emission limits for each CTG.

- NO_x: Emissions - 2.0 (parts per million by volume – dry) ppmvd at 15 percent O_2 (one-hour average, excluding startup/shutdown) and 7.59 lb/hr, with up to 10 hours per year of excursions at a level of 25 ppmvd at 15 percent O_2
- NO_x: Emissions - 2.0 ppmvd at 15 percent O_2 (annual average, excluding startup/shutdown)
- CO: Emissions - 4.0 ppmvd at 15 percent O_2 (3-hr rolling average, excluding startup/shutdown) and 9.25 lb/hr
- VOC: Emissions – 1.4 ppmvd at actual stack O_2 concentrations and 1.84 lb/hr
- PM_{10}: Emissions – 7.00 lb/hr

- SO_2: Emissions – 1.05 lb/hr with fuel sulfur content of 0.36 grains/100 scf
- NH_3: Emissions - 10 ppmvd at 15 percent O_2 (one-hour rolling average) and 14.06 lb/hr

For the cooling tower, the applicant has proposed a high efficiency drift eliminator to reduce the PM_{10} emissions from the cooling tower. The drift rate for the drift eliminator will be limited to 0.0005 percent.

Additionally, the diesel fire pump must meet SJVAPCD BACT requirements. The AFC (TID 2002a, page 8.1-60 and Table 8.1A-3) provides the following emissions control technology, or emission limits, or estimated emission rates:

Diesel Emergency IC Engines Driving Fire Pumps

- NO_x: Emissions – 3.44 lb/hr
- NO_x: Turbocharged, timing retarded engine achieving 5.2 g/hp-hr at full load
- CO: Emissions – 0.18 lb/hr
- VOC: Emissions – 0.10 lb/hr
- PM_{10}: Emissions – 0.06 lb/hr, and 0.1 g/hp-hr
- SO_2: Emissions – 0.10 lb/hr
- SO_2: Diesel fuel sulfur content limited to 0.05 percent sulfur by weight.

Emission Offsets

District Rule 2201 requires that the applicant provide emission offsets, in the form of banked ERCs, for the project's emissions of NO_x, VOC and PM_{10}. For CEQA compliance, the staff recommends that all non-attainment pollutants and their precursors that do not require offsets by District regulation, be mitigated at a minimum 1:1 ratio (i.e. for WEC, such a pollutant is SO_2). The WEC is located adjacent to the existing Walnut Peaking Power Plant (WPPP). Therefore, under District rules the facility emissions must include the WPPP emissions for comparison to the emissions offset thresholds. **AIR QUALITY Table 27** shows the applicant's estimate of the emission liabilities that need to be mitigated. Detailed annual emissions information is provided in **AIR QUALITY Table 18**.

AIR QUALITY Table 27
WEC Annual Emission Liability (lb/year)

	NO_x	VOC	PM_{10}	SO_2	CO [d]
WPPP Emissions [a]	94,977	13,155	14,032	31,555	NA
Offset Threshold	20,000	20,000	29,200	54,750	200,000
WPPP Offset Liability [b]	74,977	0	0	0	---
WEC Emissions [c]	**139,993**	**34,778**	**133,905**	17,358	203,376
Remainder of Offset Threshold	0	6,845	15,168	23,195	---
District Offset Liability	139,993	27,933	118,737	0	---
Applicants Offset Proposal	139,993	34,778	118,737	---	---

From Data Adequacy (TID 2002b) Table 8.1-28, 8.1-29, and 8.1A-6R (all revised).
Note(s):
NA = Not Available
a. Walnut Peaking Power Plant emissions, except for PM_{10} (originally 17,540 lb/yr), are based on District permit evaluation data and 877 hours per year of operation for each turbine. PM_{10} offset requirements will be fully met by limiting two of the existing peaker turbines to 8 lb/hr PM_{10} and 877 hours/year of operation (877 hr/yr x 2 turbines x 8 lb/hr PM_{10} = 14,032 lb/yr).
b. The NOx emissions shown in this row have been offset.
c. Emissions from the diesel fire pump are exempt from requiring emissions offsets because it does not operate more than 200 hours per year for non-emergency purposes and is not used pursuant to voluntary arrangements with a power supplier to curtail power.
d. Emission offsets are not required for CO in attainment areas since the Applicant has demonstrated to the satisfaction of the Air Pollution Control Officer (APCO) that the AAQS are not violated in the areas to be affected, and such emissions will be consistent with Reasonable Further Progress, and will not cause or contribute to a violation of the AAQS.

Emergency equipment that is used exclusively as emergency standby equipment for electrical power generation or any other emergency equipment as approved by the APCO that does not operate more than 200 hours per year for non-emergency purposes and is not pursuant to voluntary arrangements with a power supplier to curtail power, is exempt by District rules from providing emission offsets. With the exception of SO_2, a minimum offset ratio of greater than 1:1 is proposed for all non-attainment pollutants and their precursors.

All air pollutant offsets provided for the project are estimated on a quarterly basis. The applicant is proposing several sources of offsets to mitigate the project's potential emissions. Calculations of the required ERCs are based on the distance of the project from different sources of offsets. The District requires a 1.2:1 offsetting ratio for off-site ERCs within 15 miles. For areas outside of the 15 miles, ERCs must be provided at a ratio of 1.5:1. The District determines appropriate interpollutant offset ratios on a case-by-case basis.

Two of the ERC sources are from reductions that occurred in 1990. The validity of these ERCs (S-1834-2 and C-492-4), in terms of U.S. EPA and staff determinations, are based on U.S. EPA's final approval of the District's revised Rule 2201. However, final approval, which will not happen until the State of California Legislature makes certain changes regarding agricultural air quality exemptions, may not occur until October 2003 or later. The applicant can meet its PM_{10} offset obligations without the ERCs from certificate C-492-4, but cannot meet its NO_x offset obligations without ERC certificate S-1834-2. Condition of Certification **AQ-C8** has been added to ensure that these two credits are only used if valid. Additionally, ERC certificate S-1834-2 was originally proposed as part of the offset package for the Pastoria Power Plant project, and the

owner of that project has not formally requested a change to their offset package freeing this credit for use on this project. However, CEC staff recognizes that the ERCs in question are currently owned by the Turlock Irrigation District and , pending final approval of Rule 2201, accepts these ERCs for this project.

As shown in **AIR QUALITY Tables 28** through **AIR QUALITY Table 30**, the applicant has demonstrated, per District requirements, that it owns ERCs in quantities sufficient to offset the project's NO_x, PM_{10}, and VOC emissions.

NO_x Emission Offsets

AIR QUALITY Table 28 provides a summary of the total project NO_x emissions and identifies the project offset sources. ERC S-1834-2 was generated from the shutdown of emissions unit S-1511-0021. ERC C-482-2 was generated from steam generator conversions (reissue from 92-001).

AIR QUALITY Table 28
NO_x Offsets Available for the Walnut Energy Center

Offset Source Location	Credit Number	Date of Reduction	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)
Heavy oil western, Midway Sunset	S-1834-2	1990	27,815	18,096	11,584	21,075
Heavy oil production fields, Fresno County	C-482-2	1992	24,685	34,404	40,916	31,425
Total ERCs Provided	---	---	**52,500**	**52,500**	**52,500**	**52,500**
Total Offsets Provided @1.5:1	---	---	**35,000**	**35,000**	**35,000**	**35,000**
Total Required [a]	---	---	34,998	34,998	34,998	34,998
Total Unadjusted Remaining*	---	---	1.75	1.75	1.75	1.75

From AFC (TID 2002a) Appendix 8.1F, Attachment 8.1F-1 (ERCs), and Data Adequacy (TID 2002b), Table 8.1-29, pages 8.1-61 to 62, and replacement page for Appendix 8.1F, page 8.1F-1.
Note(s):
a. Total Required per Quarter = Annual Emissions / 4 Quarters = 139,993 / 4 = 34,998.25
* A zero balance means full mitigation, a negative balance indicates an offsets deficit, and a positive balance indicates offsets are available in excess of required offset levels. Please note that the offset balance is not the same as the ERC balance.

The applicant appears to be in compliance with the District's NO_x offset requirements and is providing ERCs at a total offset ratio of greater than 1:1.

PM_{10} Emission Offsets

AIR QUALITY Table 29 provides a summary of the total project PM_{10} emissions and identifies the project offset sources. ERC C-486-4 was generated from the shutdown of oil and meal production equipment. ERCs C-488-4 and C-494-4 were generated from the shutdown of entire stationary sources. ERCs C-491-4, C-495-4, and N-335-4 were generated from the shutdown of emissions units. ERC C-492-4 was generated from the replacement of 2D-2D cyclones and screen baskets with 1D-3D cyclones. ERC C-510-4 was generated from the shutdown of a cotton gin. ERCs N-333-4 and N-334-4 were generated from the addition of 1D-3D cyclones to cotton gins. ERC N-336-4 was generated from the replacement of screen baskets with 1D-3D cyclones.

AIR QUALITY Table 29
PM_{10} Offsets Available for the Walnut Energy Center

Offset Source Location	Credit Number	Date of Reduction	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)
25184 Road 16, Chowchilla	C-486-4	2000	27,222	23,025	9,864	10,526
4142 Road 16, Madera	C-488-4	2000	654	0	0	20,809
25184 Road 16, Chowchilla	C-491-4	2001	21,048	18,920	0	3,163
42573 Nees Avenue, Firebaugh	C-492-4	1990	0	0	0	625
19625 Road 13, Chowchilla	C-494-4	2002	0	0	0	8,915
13221 Avenue 18 ½, Chowchilla	C-495-4	1999	0	0	0	13,992
31055 W. Adams, Tranquility	C-510-4	No Data	0	0	0	6,430
16490 S. Indiana, Dos Palos	N-333-4	1994	0	0	65	4,877
18998 W. Cotton Gin Road, Los Banos	N-334-4	1994	2	0	0	1,367
7096 S. Plainsburg Road, Le Grand	N-335-4	1999	0	0	91	6,001
7096 S. Plainsburg Road, Le Grand	N-336-4	1992	0	0	0	2,834
Total ERCs Provided	---	---	**48,926**	**41,945**	**10,020**	**79,539**
Total Offsets Provided @ 1.5:1	---	---	**32,617**	**27,963**	**6,680**	**53,026**
Total Required [a]	---	---	29,684	29,684	29,684	29,685
Difference	---	---	2,933	-1,721	-23,004	23,341
Distribute Q1 and Q4 to Q2 and Q3	---	---	**-1,721**	**1,721**	**23,004**	-23,004
Total Unadjusted Remaining	---	---	**1,212**	**0**	**0**	**337**
ERC Balance Remaining * (adjusted for 1.5:1 ratio)	---	---	**1,818**	**0**	**0**	**506**

From AFC (TID 2002a) Appendix 8.1F, Attachment 8.1F-1 (ERCs), Data Adequacy (TID 2002b), Table 8.1-29, pages 8.1-61 and 8.1F-1, and Data Response, Set 1B (TID 2003b), DRR #22 and Attachment AQ-22.
Note(s):
a. Total Required per Quarter = (Annual Emissions from WPPP + Annual Emissions from WEC – Offset) / 4 Quarters = (14,032 + 133,905 - 29,200) / 4 = 29,684.25.
* A zero balance means full mitigation, a negative balance indicates an offsets deficit, and a positive balance indicates offsets are available in excess of required offset levels. Please note that the offset balance is not the same as the ERC balance.

Pursuant to Section 4.13.7 of the SJVAPCD, actual emissions reductions for PM that occurred from October through March (Q4 to Q1) may be used to offset increases in PM during any period of the year. Worst-case ambient PM conditions occur during winter and fall (Q4 to Q1). To further encourage the production of ERC credits in Q4 and Q1, the SJVAPCD allows these credits to be applied to any period of the year. For the WEC, surplus PM_{10} credits from the 1st and 4th quarters (Q1 and Q4) are therefore applied to the 2nd and 3rd quarters (Q2 and Q3). Thus, the Applicant appears to be in compliance with the District's PM_{10} offset requirements and is providing ERCs at a total offset ratio of greater than 1:1.

VOC Emission Offsets

AIR QUALITY Table 30 provides a summary of the total project VOC emissions and identifies the project offset sources. ERC C-484-1 was generated from the shutdown of oil and meal production equipment.

AIR QUALITY Table 30
VOC Offsets Available for the Walnut Energy Center

Offset Source Location	Credit Number	Date of Reduction	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)
25184 Road 16, Chowchilla	C-484-1	2000	13,350	13,350	13,350	13,350
Total Offsets Provided @ 1.5:1	---	---	**8,900**	**8,900**	**8,900**	**8,900**
Total Required [a]	---	---	8,694	8,695	8,695	8,694
Total Unadjusted Remaining	---	---	206	205	205	206
Balance Remaining (adjusted for 1.5:1 ratio)	---	---	**309**	**307.5**	**307.5**	**309**

From AFC (TID 2002a) Appendix 8.1F, Attachment 8.1F-1 (ERCs), and Data Adequacy (TID 2002b), Table 8.1-29, pages 8.1-61 and 8.1F-1.
Note(s):
a. Total Required per Quarter = (Annual Emissions) / 4 Quarters = (34,778) / 4 = 8,694.5.
* A zero balance means full mitigation, a negative balance indicates an offsets deficit, and a positive balance indicates offsets are available in excess of required offset levels. Please note that the offset balance is not the same as the ERC balance.

The applicant is in compliance with the District's VOC offset requirements and is providing ERCs at a total offset ratio of greater than 1:1.

SO_2 Emission Offsets

SO_2 emission offsets are not required by District Rule 2201 for this project, and the Applicant is not proposing to provide SO_2 emission offsets. However, SO_2 emissions are a precursor to PM_{10}, which is a nonattainment pollutant at the project site area. As part of the CEQA evaluation, the staff recommends that all non-attainment pollutants and their precursors that do not require offsets by District regulation be mitigated at a minimum 1:1 ratio.

Adequacy of Proposed Mitigation

Staff believes that the applicant's proposed ammonia slip level of 10 ppm could be lowered. CARB recommends that the air permit should include conditions to minimize the amount of ammonia slip to a health protective level when selective catalytic reduction is used as a control method. They thus recommend that air pollution districts should consider establishing ammonia slip levels at or below five ppm at 15 percent oxygen. The San Joaquin Valley Air Pollution Control District recommended an ammonia slip level of 10 ppm in the PDOC.

Information from the SCR manufacturer indicates that a five ppm ammonia slip can be designed and achieved by the proposed system, and that the primary benefit in allowing a 10 ppm ammonia slip level would be that the project owner could keep the catalyst three to five years longer. Both the CARB and the U.S. EPA have recommended that ammonia slip levels be maintained at five ppm. Additionally, the South Coast Air Quality Management District requires an ammonia slip level of five ppm in order to meet its BACT requirement.

A number of combined cycle combustion turbine projects have recently been permitted in the State of California with an ammonia slip permit level of five ppm (with NO_x limits of two ppm), including the City of Vernon Malberg project and Magnolia Power Plant

projects in the South Coast Air Quality Management District, the currently operating Duke Moss Landing Power Plant Project in Monterey County, and the proposed Tesla Power Plant project in the Bay Area Air Quality Management District. Additionally, the Cosumnes Power Plant Project, East Altamont Energy Center, and Palomar Energy Project have been recommended by staff to be licensed at five ppm ammonia. Other power plants outside of the State of California permitted with low NOx and ammonia limits include the ANP Blackstone and Bellingham projects in Massachusetts (two ppm NOx @ two ppm ammonia), and the Reliant Energy Hope Rhode Island project (two ppm NOx @ five ppm ammonia). The Blackstone Energy facility in Massachusetts has been operated for over 5,000 hours with less than two ppm NOx and ammonia level at less than 0.1 ppm (MDEP, 2003).

Considering that the San Joaquin Valley suffers from a very serious PM_{10} air quality problem, adding more ammonia emissions would only aggregate that problem. CARB recommends that air districts should establish ammonia slip levels at five ppm or less. There are many examples of power plants with SCR that are operating or under construction, or under permit elsewhere in California that are limited to five ppm ammonia. Therefore, staff recommends that the Commission consider that the ammonia slip level for the TID project be set at five ppm.

Concerning all other pollutants, staff concurs with the District's determination that the project's proposed emission controls/emission levels meets BACT requirements and that the proposed emission levels are reduced to the lowest technically feasible levels.

There is the potential for the two ERCs (S-1834-2 and C-492-4) created from emission reductions in 1990 to be deemed invalid if the revised rule 2201 is never formally approved and those credits are not included in approved attainment plans. For now, staff is considering these credits to be conditionally valid, and has included Condition of Certification **AQ-C8** to ensure that these credits are used properly.

The District does not require offsets for the project's SO_2 emissions, and the applicant is not proposing to offset these emissions. Staff believes that it is necessary to fully mitigate all non-attainment pollutants and their precursors at a minimum offset ratio of 1:1. It is the applicant's contention that the SO_2 impacts from the project are mitigated by the PM_{10} emission reduction credits required to offset the project's PM_{10} emissions (TID 2002a, page 8.1-62). However, the PM_{10} ERCs provided are not considered to be excess, since the 1.5:1 offset ratio required for these credits are designed to allow the District to meet its NSR program requirements and efforts for further progress. Staff would also note that the facility will emit more than 100 tons per year of ammonia, another PM_{10} precursor that will not be offset. Therefore, staff does not believe that the applicant's offset package is adequate, and will recommend additional ERCs to cover the project's SO_2 emissions.

Staff Proposed Mitigation

Staff proposes, in Condition of Certification **AQ-31**, that the ammonia emissions from the HRSGs be limited to five ppm on a rolling 24-hour basis. Staff proposes in Condition of Certification **AQ-C6** that that the applicant obtain valid ERCs to mitigate the project's SO_2 emissions at a 1:1 ratio. Staff proposes, in Condition of Certification **AQ-C8**, that the use of ERC certificates S-1834-2 and C-492-4 be allowed if the EPA

formally approves District Rule 2201, or if those ERCs are included in an EPA approved attainment plan.

CUMULATIVE IMPACTS

To evaluate the cumulative emission impacts of the Walnut Energy Facility, District records were evaluated to determine other sources that may cumulatively impact the site area. The following criteria were used to identify other stationary emission sources located within six miles of the WEC site that may contribute to cumulative impacts:

- sources that have received an Authority to Construct (ATC) permit and operation began after 1999;
- sources that have received an ATC permit but are not yet operational; or
- sources that have submitted complete ATC applications to the District.

Emissions from existing projects operating prior to and during 1999 are reflected in the background ambient air quality data. Therefore, it was not necessary to include them in the cumulative impact analysis.

A review of District records indicates that there are no new permitted projects or proposed projects with any non-VOC emissions potential of greater than five tons per year being permitted within six miles of the project site (TID 2003b, DRR #23). These are the types of projects that would have the potential to contribute to cumulative impacts. While there are several other known proposed or recently constructed medium to large power plant projects, including the Tracy Peaker Power Plant Project, East Altamont Energy Center, Tesla Power Plant Project, and Modesto Irrigation District's Woodland Generating Station 2 and Electrical Generating Station - Ripon projects, all proposed within 50 miles of the WEC, no significant overlap of the emission plumes from these widely spaced projects would be expected. Therefore, no cumulative modeling analysis was required and no significant cumulative impacts are expected as a result of this project in combination with other known projects.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed WEC electrical power generation facility (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters. Staff also reviewed Census 1990 information that shows the low-income population is less than 50 percent within the same radius. Additionally, based on the Air Quality modeling analysis, and given the prominent wind direction, staff has not identified unmitigated significant, nor potentially disproportionate impacts, to those pockets or clusters that are primarily minority. Therefore, there are no Air Quality environmental justice issues related to this project.

COMPLIANCE WITH LORS

The San Joaquin Valley Air Pollution Control District submitted a Preliminary Determination of Compliance (PDOC) for the WEC project on April 25, 2003 (SJVAPCD 2003). Compliance with all District Rules and Regulations was demonstrated, to the District's satisfaction in the PDOC. The District's PDOC conditions are presented in the Conditions of Certification.

FEDERAL

The District is responsible for issuing the Federal New Source Review (NSR) permit. This project does not trigger PSD permitting. The District has issued a PDOC, which indicates that the project is in compliance with all NSR requirements (SJVAPCD 2003a). Staff will evaluate comments received from EPA on the PDOC summarize those comments in the Final Staff Assessment.

STATE

California State Health and Safety Code, Section 41700 requires that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerate number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property." Staff believes that the project, with all of the Conditions of Certification provided, has demonstrated compliance with California State Health and Safety Code, Section 41700, as the air pollutant emissions from the project have been reasonably demonstrated to not singly or cumulatively cause injury, annoyance, or damage to persons, businesses or property.

LOCAL

The SJVAPCD is the lead agency for managing air quality and coordinating planning efforts within the Stanislaus County portion of the San Joaquin Valley Air Basin, so that the ozone and PM_{10} standards are attained in a timely fashion. The District is responsible for developing that portion of the State Implementation Plan (SIP), and the Air Quality Management Plan (AQMP), that deals with certain stationary and area source controls and, in cooperation with the transportation planning agencies (TPAs), the development of transportation control measures (TCMs). The California Air Resources Board (CARB) is responsible for submitting the SIP to U.S. EPA.

Currently, neither the District's ozone nor PM_{10} AQMPs are approved by USEPA. The existing ozone AQMP is no longer valid, as its timeline has expired. The ozone AQMP was for a serious non-attainment area, which due to the failure to achieve attainment, has since been redesignated as a severe non-attainment area. The original ozone AQMP called for the air basin to be in attainment of federal ozone standards by 2001, and failing that attainment goal required the District to submit a Severe Nonattainment Ozone AQMP to EPA by May 31, 2002. The District did not make the required submittal date and is currently under an offset and federal highway funds sanction timeline to complete the revised AQMP within 18 and 24 months, respectively. The redesignation to severe nonattainment requires that the District provide the EPA a plan to achieve attainment by 2005. The District is in the process of preparing a revised

ozone AQMP, which is anticipated to request that the air basin be further redesignated as an extreme non-attainment area. This redesignation would change the required attainment demonstration date in the AQMP to 2010. The PM_{10} attainment plan that was submitted in 1997 did not provide a demonstration with attainment and was later withdrawn by the state. However, in the March 21, 2003 Federal Register (Vol. 68, No. 55), the U.S. EPA found that the SJVAPCD failed to submit a SIP for PM_{10}. The plan was due on December 31, 2002, and was not received. A sanctions clock, similar to what is described above for ozone, now applies for PM_{10}. The District recently issued (March 25, 2003) the Draft 2003 PM_{10} Plan for comment.

The SJVAPCD rules and regulations specify the emissions control and offset requirements for new sources, such as the Walnut Energy Center Facility. Best Available Control Technology (BACT) will be implemented, and ERCs, obtained by the applicant and approved and certified by the SJVAPCD will fully mitigate project's nonattainment pollutant (including precursors) emissions, so that they would be consistent with the strategies and future emissions anticipated under the AQMP.

The compliance with local regulations is based in part on the PDOC (SJVAPCD 2003a) and in part based on staff interpretation. Staff is currently completing its review of the PDOC and will be providing comments on the PDOC to the District.

Rule 1080 – Stack Monitoring

The compliance with this rule is provided for in the Conditions of Certification. (**AQ-7, AQ-9, AQ-10, AQ-12 through AQ-15, and AQ-56**).

Rule 1081 – Source Sampling

The compliance with this rule is provided for in the Conditions of Certification. (**AQ-11, AQ-38** through **AQ-40**, and **AQ-44** through **AQ-51**

Rule 1100 – Equipment Breakdown

The compliance with this rule is provided for in the Conditions of Certification. (**AQ-61**, **AQ-62**).

Rule 2010 – Permits Required

By the submission of an AFC and an Authority to Construct (ATC) application for the Walnut Energy Center, the applicant is complying with the requirements of the rule. The PDOC has been completed and the final permit will be issued after completion of the FDOC and if the CEC certifies this project.

Rule 2201 – New and Modified Stationary Source Review Rule

Section 4.1 – Best Available Control Technology

As shown in the PDOC, the applicant's control technology proposal meets the Best Available Control Technology requirements of this rule as interpreted by the SJVAPCD.

Section 4.2 – Offsets

As shown in the PDOC and above, the applicant's offset mitigation proposal, in terms of the types and quantities of ERCs proposed, meets the requirements of this rule as interpreted by the District.

Rule 2520 – Federally Mandated Operating Permits

The rule generally requires that an affected source file for a Title V operating permit within 12 months of commencing operation. This requirement is provided as Condition of Certification **AQ-100**.

Rule 2540 – Acid Rain Program

WEC will be required to file for a Title IV Acid Rain operating permit to comply with this regulation. This requirement is also provided as Condition of Certification **AQ-60** and staff is recommends in the verification for this condition, that the Title IV permit and necessary pollutant allotments be obtained prior to the first firing of the turbines.

Rule 4001 – New Source Performance Standards

The project's emission limits, which are listed in the proposed conditions of certification, (**AQ-5, AQ-19**),are significantly lower than the limits required by the applicable New Source Performance Standard (Title 40, Code of Federal Regulations, Part 60, Chapter 1. Subpart GG).

Rule 4101 – Visible Emissions

The use of pipeline quality natural gas, proper combustion techniques and the PM_{10} BACT limits for the turbines and the use of CARB-certified diesel fuel or very low sulfur diesel fuel and oxidation catalyst (if technologically feasible) for the diesel fire pump, will guarantee that the visible emissions are well less than No. 1 on the Ringelmann chart (20 percent opacity) for more than three minutes in any one hour.

Rule 4102 – Nuisance

The use of pipeline quality natural gas, low sulfur diesel fuel, and proper combustion techniques will ensure the project's emission will not cause a public nuisance.

Rule 4201 – Particulate Matter Concentration

The BACT PM_{10} emission limits for the turbines and fire pump engine will ensure that their respective particulate matter emissions are well below this rule's emission limit of 0.1 gr/dscf of gas calculated to 12 percent carbon dioxide. The estimated turbine and fire pump emissions are 0.0026 gr/dscf (TID 2002a, Table 8.1A-1, Case 2) and 0.023 gr/dscf (TID 2002a, 8.1A-3), respectively.

Rule 4202 – Particulate Matter Emission Rate

Gas and liquid fuels are excluded from the definition of process weight. Therefore, Rule 4202 does not apply to the proposed units.

Rule 4701 – Stationary Internal Combustion Engines

Since the fire pump engine proposed for this project will be limited to 100 hours per year, and is used exclusively for fire fighting services, it is exempt from this rule.

Rule 4703 – Stationary Gas Turbines

The conditions of certification taken from the PDOC include the required monitoring and record keeping requirements of this rule. The NO_x and CO compliance emissions limits of this rule are less stringent than the applicable BACT emission limits for the WEC project .

Rule 4801 – SO_2 Concentration

The use of pipeline quality natural gas will guarantee that the emissions of sulfur compounds are no greater than 0.2 percent by volume, calculated as SO_2 on a dry basis.

Rule 7012 – Hexavalent Chromium – Cooling Towers

The project will not use hexavalent chromium containing compounds for treating the cooling tower water. The compliance with this rule is provided for in Condition of Certification **AQ-76**.

Regulation VIII – Fugitive PM_{10} Prohibitions

Rule 8011 – General Requirements; Rule 8021 – Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities; Rule 8031 – Bulk Materials; Rule 8041 – Carryout and Trackout; Rule 8051 – Open Areas; Rule 8061 – Paved and Unpaved Roads; Rule 8071 – Unpaved Vehicle/Equipment Traffic Areas; Rule 8081 – Agricultural Sources

Staff proposed Condition of Certification **AQ-C3** requires that the project owner provide a Construction Fugitive Dust Mitigation Plan to be approved prior to construction and requires compliance with all appropriate Regulation VIII rules. Additionally, proposed Conditions of Certification **AQ-102** to **AQ-108** require compliance with appropriate Regulation VIII rules.

FACILITY CLOSURE

The WEC has a planned life of 30 years or more. Eventually the WEC will close, as a result of the end of its useful life; through some unexpected situation such as a natural disaster or catastrophic facility breakdown; or if the facility became economically noncompetitive earlier than 30 years, forcing decommissioning. When the facility closes, all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur.

During the operating life of the facility, temporary facility closure may be required and permanent facility closure would eventually be required. Temporary closure constitutes an unexpected shutdown for a period exceeding the time required for normal maintenance (e.g., for overhaul or replacement of combustion turbines). Cause for temporary closure might include a disruption in the supply of natural gas or damage to the plant from an earthquake, fire, storm, or other event. Permanent closure constitutes a complete cessation in operations with no intent to restart operations, due to plant age, damage to the plant that is beyond repair, economic conditions, or other reasons.

The Permit to Operate (PTO), issued by the District, is required for operation of the facility and the Applicant must pay permit fees annually while it maintains the PTO. If the Applicant chooses to close the facility and not pay the permit fees, then the PTO would be cancelled. In that event, the project could not restart and operate unless the Applicant pays the fees to renew the PTO.

When permanent closure occurs and if it were decided to dismantle the project's equipment and structures, there would likely be fugitive dust emissions associated with this dismantling effort. A Decommissioning Plan shall be submitted to the Energy Commission Compliance Project Manager and should include the specific details regarding how the Applicant plans to demonstrate compliance with the District Rules (i.e. Regulation VIII requirements) regarding fugitive dust emission mitigation.

A detailed description of the closure requirements are provided in the General Conditions Including Compliance Monitoring and Closure Plan section of the Staff Assessment.

CONCLUSIONS

With the following proposed Conditions of Certifications and appropriate ERCs, and with the District's Final Determination of Compliance, the project is not expected to have any significant air quality impacts. Staff is proposing condition of certification (**AQ-C1** through **AQ-C4**) that would mitigate the potential construction impacts.
In addition, staff is proposing Condition **AQ-31** that would limit the ammonia slip to 5 ppm corrected to 15 percent oxygen. Concerning the SO_2 emission reductions, prior to the filing of the Final Staff Assessment, the applicant will need to obtain the SO_2 ERCs recommended in Condition of Certification **AQ-C6**. With these additional SO_2 ERCs, the applicant will have a complete offset package that satisfies the SJVACPD permitting requirements and staff CEQA concerns.

Staff recommends the following conditions of certification to address the impacts associated with the construction and operation of the WEC. However, the conditions presented below may be revised to address comments received on the PDOC or this Preliminary Staff Assessment.

CONDITIONS OF CERTIFICATION

STAFF CONDITIONS

AQ-C1. The project owner shall fund all expenses for an on-site air quality construction mitigation manager (AQCMM) who shall be responsible for maintaining compliance with conditions **AQ-C2** through **AQ-C4** for the entire project site and linear facility construction. The on-site AQCMM shall have full access to areas of construction of the project site and linear facilities, and shall have the authority to appeal to the CPM to have the CPM stop any or all construction activities as warranted by applicable construction mitigation conditions. The on-site AQCMM shall have a current certification by the California Air Resources Board for Visible Emission Evaluation prior to the commencement of ground disturbance. The on-site AQCMM shall not be terminated without written consent of the CPM.

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit to the CPM, for approval, the name, current ARB Visible Emission Evaluation certificate, and contact information for the on-site AQCMM.

AQ-C2. The project owner shall provide a construction mitigation plan (CMP), for approval, which shows the steps that will be taken, and reporting requirements, to ensure compliance with conditions **AQ-C3** and **AQ-C4**.

Verification: At least 60 days prior to start any ground disturbance, the project owner shall submit to the CPM, for approval, the construction mitigation plan. The CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt. Otherwise, the plan shall be deemed approved.

AQ-C3. The on-site AQCMM shall submit to the CPM, in the monthly compliance report (MCR), a construction mitigation report that demonstrates compliance with the following mitigation measures:

a) All unpaved roads and disturbed areas in the project and linear construction sites shall be watered until sufficiently wet. The frequency of watering can be reduced or eliminated during periods of precipitation.

b) No vehicle shall exceed 10 miles per hour within the construction site.

c) The construction site entrances shall be posted with visible speed limit signs.

d) All vehicle tires shall be washed or cleaned free of dirt prior to entering paved roadways.

e) Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

f) All entrances to the construction site shall be treated with dust soil stabilization compounds.

g) No construction vehicles can enter the construction site unless through the treated entrance roadways.

h) Construction areas adjacent to any paved roadway shall be provided with sandbags to prevent run-off to the roadway.

i) All paved roads within the construction site shall be swept twice daily.

j) At least the first 500 feet of any public roadway exiting from the construction site shall be swept twice daily.

k) All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or be treated with appropriate dust suppressant compounds.

l) All vehicles that are used to transport solid bulk material and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.

m) All construction areas that may be disturbed shall be equipped with windbreaks at the windward sides prior to any ground disturbance. The windbreaks shall remain in place until the soil is stabilized or permanently covered with vegetation.

n) Any construction activities that can cause fugitive dust in excess of the visible emission limits specified in Condition **AQ-C4** shall cease when the wind exceeds 25 miles per hour.

o) All diesel-fueled engines used in the construction of the facility shall be fueled only with ultra-low sulfur diesel, which contains no more than 15 ppm sulfur.

p) All large construction diesel engines, which have a rating of 50 hp or more, shall meet, at a minimum, the Tier 1 ARB/EPA certified standards for off-road equipment.

q) All large construction diesel engines, which have a rating of 50 hp or more that do not have an EPA Tier 1 particulate standard (50 to 175 hp engines) and do not meet Tier 2 particulate standards, shall be equipped with catalyzed diesel particulate filters (soot filters), unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types.

r) All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM that shows the engine meets the conditions AQ-C3(p) and AQ-C3(q) above.

s) The construction mitigation measures shall include necessary fugitive dust control methods as required to maintain compliance with District Rules 8021 through 8081 (Conditions AQ-111 to AQ-117). Any conflict between mitigation measures (a) through (r) and District Rules 8021 through 8081 will be identified in the CMP, with a specified resolution for each conflict identified.

Observations of visible dust plumes would indicate that the existing mitigation measures are not resulting in effective mitigation. The AQCMM shall implement the following procedures for additional mitigation measures if the AQCMM determines that the existing mitigation measures are not resulting in effective mitigation:

a) The AQCMM shall direct more aggressive application of the existing mitigation methods within 15 minutes of making such a determination.

b) The AQCMM shall direct implementation of additional methods of dust suppression if step a) specified above, fails to result in adequate mitigation within 30 minutes of the original determination.

c) The AQCMM shall direct a temporary shutdown of the source of the emissions if step b) specified above fails to result in adequate mitigation within one hour of the original determination. The activity shall not restart until one full hour after the shutdown. The owner/operator may appeal to the CPM any directive from the AQCMM to shutdown a source, provided that the shutdown shall go into effect within one hour of the original determination unless overruled by the CPM before that time.

Verification: In the MCR, the project owner shall provide the CPM a copy of the construction mitigation report and all diesel fuel purchase records, including quantity purchased, which clearly demonstrates compliance with condition **AQ-C3**.

AQ-C4 No construction activities are allowed to cause visible emissions at or beyond the project site fenced property boundary. No construction activities are allowed to cause visible plumes that exceed 20 percent opacity at any location on the construction site. No construction activities are allowed to cause any visible plume in excess of 200 feet beyond the centerline of the construction of linear facilities, or cause visible plumes to occur within 100 feet upwind of any occupied structures that are not under the control of the project owner.

Verification: The on-site AQCMM shall conduct a visible emission evaluation at the construction site fence line, or 200 feet from the center of construction activities at the linear facility, or adjacent to occupied structures, each time he/she sees excessive fugitive dust from the construction or linear facility site. The records of the visible emission evaluations shall be maintained at the construction site and shall be provided to the CPM on the monthly construction report.

AQ-C5 The project owner shall submit to the CPM for review and approval any modification proposed by either the project owner or issuing agency to any project air permit.

Verification: The project owner shall submit any proposed air permit modification to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-C6 The project owner shall provide 17,358 lbs/yr of SO_2 offsets, 4,340 lbs/quarter, using the following ERC certificates: (This will need to be completed when the applicant provides their SO_2 offset proposal in a manner that offsets the project's SO_2 emissions on a 1:1 offset basis)

Verification: At least 60 days prior to commencing turbine first fire, the project owner shall surrender the identified ERC certificates and in the amounts shown in **AQ-C6** to the District and provide documentation of that surrender to the CPM. Changes to the offsetting proposal must be provided to the District and CPM for review, public noticing, and approval.

AQ-C7 The project owner shall submit to the CPM and APCO Quarterly Compliance Reports, no later than 30 days following the end of each calendar quarter, that include operational and emissions information as necessary to demonstrate compliance with Conditions **AQ-1** through **AQ-108**. The Quarterly Operational Report will specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit the Quarterly Operational Reports to the CPM and APCO no later than 30 days following the end of each calendar quarter.

AQ-C8 The project owner shall only use ERC certificates S-1834-2 and C-492-4 to offset the project if EPA provides final approval of District Rule 2201 or the District includes those ERCs in an EPA approved attainment plan.

Verification: The project owner shall submit proof to the CPM that the listed ERCs comply with the requirements of the condition when providing documentation required to comply with **AQ-95** and **AQ-99**.

DISTRICT PRELIMINARY DETERMINATION OF COMPLIANCE CONDITIONS

Sjvacpd Permit No. Unit N-2246-3-0: 84 Mw Nominally Rated Combined-Cycle Power Generating System #1 Consisting Of A 1,047 Mmbtu/Hr General Electric Frame 7ea Natural Gas-Fired Combustion Turbine Generator With Dry Low Nox Combustor, An Inlet Air Filtration And Evaporative Cooling System, A Selective Catalytic Reduction (Scr) System, An Oxidation Catalyst, Heat Recovery Steam Generator #1 (Hrsg) And A 100 Mw Nominally Rated Steam Turbine Shared With N-2246-4.

Sjvacpd Permit No. Unit N-2246-4-0: 84 Mw Nominally Rated Combined-Cycle Power Generating System #2 Consisting Of A 1,047 Mmbtu/Hr General Electric Frame 7ea Natural Gas-Fired Combustion Turbine Generator With Dry Low Nox Combustor, An Inlet Air Filtration And Evaporative Cooling System, A Selective Catalytic Reduction (Scr) System, An Oxidation Catalyst, Heat Recovery Steam Generator #2 (Hrsg) And A 100 Mw Nominally Rated Steam Turbine Shared With N-2246-3.

Conditions of Certification AQ-1 through AQ-75 apply per turbine/HRSG unit unless otherwise identified.

AQ-1 The project owner shall notify the District of the date of initiation of construction no later than 30 days after such date, the date of anticipated startup not more than 60 days nor less than 30 days prior to such date, and the date of actual startup within 15 days after such date. [District Rule 4001]

Verification: The project owner shall notify the CPM and the District of the date of initiation of construction no later than 30 days after such date, the date of anticipated startup, defined here as first turbine fire, not more than 60 days or less than 30 days prior to such date, and the date of actual startup within fifteen (15) days after such date.

AQ-2 The heat recovery steam generator shall provide space for additional selective catalytic reduction catalyst and additional oxidation catalyst. The additional space shall be sufficient to house the quantity of catalyst material necessary to achieve and maintain compliance with the emission limits. [District Rule 2201]

Verification: The project owner shall submit SCR and oxidation catalyst design details that demonstrate compliance with this condition to the APCO and the CPM 30 days prior to commencement of construction.

AQ-3 The gas turbine engine and generator lube oil vents shall be equipped with mist eliminators. Visible emissions from lube oil vents shall not exhibit opacity of 5% or greater except for up to three minutes in any hour. [District Rules 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission to verify the installation and proper operation of the lube oil vent mist eliminators.

AQ-4 Prior to the issuance of the Permit to Operate, the project owner shall submit to the District information correlating the NOx control system operating parameters to the associated measured NOx output. The information must be sufficient to allow the District to determine compliance with the NOx emission limits of this permit during times that the CEMS is not functioning properly. [District Rule 4703]

Verification: The project owner shall compile the required NOx control system and emissions data and submit the information to the CPM and the APCO in the Quarterly Operational Reports (**AQ-C7**).

AQ-5 The gas turbine engine shall be fired exclusively on natural gas with a sulfur content of no greater than 0.36 grain of sulfur compounds (as S) per 100 dry scf of natural gas. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO the fuel sulfur content data, as required to be compiled in Condition **AQ-6**, demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-6 Testing to demonstrate compliance with the fuel sulfur content limit of this permit shall be conducted weekly. Once eight consecutive weekly tests show compliance, the fuel sulfur content testing frequency may be reduced to once every calendar quarter. If quarterly testing shows a violation of the sulfur content limit of this permit then weekly testing shall resume and continue until eight consecutive tests show compliance. Once compliance is shown on eight consecutive weekly tests then testing may return to quarterly. [District Rule 2201]

Verification: The fuel sulfur content data shall be submitted to the CPM and the APCO in the Quarterly Operational Reports (**AQ-C7**).

AQ-7 The exhaust stack shall be equipped with a continuous emission monitor (CEM) for NOx, CO, and O2. The CEM shall meet the requirements of 40 CFR parts 60 and 75 and shall be capable of monitoring emissions during startups and shutdowns as well as during normal operating conditions. [District Rules 2201 and 1080]

Verification: The project owner shall provide a Continuous Emission Monitoring System (CEMS) protocol for approval by the CPM and the APCO at least 60 days prior to installation of the CEMS. The project owner shall make the site available for inspection of the CEMS by representatives of the District, CARB and the Commission.

AQ-8 The project owner shall monitor and record the fuel flow rate to the turbine, NOx emission rate, the CO emission rate, the ammonia injection rate, the exhaust temperature both prior to and after the SCR unit, the exhaust oxygen content, and the exhaust flow rate. [District Rules 2201, 4001, and 4703]

Verification: The project owner shall make the site available for inspection of measuring equipment for fuel flow rate, NOx and CO emission rates, ammonia injection rate, and exhaust gas temperature, and the associated records by representatives of the District, CARB and the Commission.

AQ-9 The facility shall install and maintain equipment, facilities and systems compatible with the District's CEM data polling software system and shall make CEM data available to the District's automated polling system on a daily basis. [District Rule 1080]

Verification: The project owner shall provide a Continuous Emission Monitoring System (CEMS) protocol for approval by the CPM and the APCO at least 60 days prior to installation of the CEMS. The project owner shall make the site available for inspection of the CEMS by representatives of the District, CARB and the Commission.

AQ-10 Upon notice by the District that the facility's CEM system is not providing polling data, the facility may continue to operate without providing automated data for a maximum of 30 days per calendar year provided the CEM data is sent to the District by a District-approved alternative method. [District Rule 1080]

Verification: The project owner shall provide required non-polled CEM data to the District by a District-approved alternative method.

AQ-11 The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

Verification: Prior to construction of the turbine stacks the project owner shall provide to the CPM for approval detailed plan drawings of the turbine stacks that show the sampling ports and demonstrate compliance with the requirements of this condition. The project owner shall make the site available for inspection of the turbine stacks by representatives of the District, CARB and the Commission.

AQ-12 Results of continuous emissions monitoring shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3.3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA. [District Rule 1080]

Verification: None.

AQ-13 Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO the CEMS audits demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-14 The owner/operator shall perform relative accuracy test audit (RATA) as specified by 40 CFR Part 60, Appendix F, 5.11, at least once every four calendar quarters. The project owner shall comply with the applicable

requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO the CEMS audits demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-15 The project owner shall submit a written report to the APCO for each calendar quarter, within 30 days of the end of the quarter, including: time intervals, data and magnitude of excess emissions, nature and cause of excess emissions (if known), corrective actions taken and preventive measures adopted; averaging period used for data reporting shall correspond to the averaging period for each respective emission standard; applicable time and date of each period during which the CEM was inoperative (except for zero and span checks) and the nature of system repairs and adjustments; and a negative declaration when no excess emissions occurred. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO the excess emissions and other data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-16 Startup is defined as the period beginning with boiler initial firing until the unit meets the lb/hr or ppmvd emission limits for steady state operation. Shutdown is defined as the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Startup and shutdown durations shall not exceed 296 hours per calendar year. Startup emissions must be counted toward each applicable emission limit (lb/day and lb/yr). [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO the turbine startup and shutdown event duration data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-17 The cumulative startup and shutdown period duration shall not exceed five hours in any one day, commencing at midnight. Emissions during startup and shutdown periods must be must be counted toward the applicable daily emission limitations. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO the turbine startup and shutdown event duration data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-18 The NOx emissions during startup and shutdown periods shall not exceed 119.0 lb/hour. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-19 The NOx emissions concentration during steady state operation shall not exceed 2.0 ppmvd @ 15% O2 over a 1 hour rolling average. Steady-state period refers to any periods that are not a startup or shutdown period. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-20 The combined total NOx emissions from startup, shutdown, and steady state operation shall not exceed 444.2 lb/day. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-21 Compliance with NOx emission limitations during steady state operation shall not be required during short-term excursions limited to a cumulative total of 10 hours per rolling 12-month period. Short-term excursions are defined as 15 minute periods designated by the owner/operator (and approved by the APCO) that are the direct result of transient load conditions, not to exceed four consecutive 15-minute periods, when the 15-minute average NOx concentration exceeds 2.0 ppmvd @ 15% O2. The maximum one-hour average NOx concentration for periods that include short-term excursions shall not exceed 30 ppmvd @ 15% O2. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-22 Examples of transient load conditions include, but are not limited to the following: (1) Initiation/shutdown of combustion turbine inlet air cooling and (2) Rapid combustion turbine load changes. All emissions during short-term excursions shall accrue towards the hourly, daily, and annual emissions limitations of this permit and shall be included in all calculations of hourly, daily, and annual mass emission rates as required by this permit. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-23 The CO emissions during startup and shutdown periods shall not exceed 129.0 lb/hour. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-24 The CO emissions concentration during steady state operation shall not exceed 4.0 ppmvd @ 15% O2 over a 3 hour rolling average. Steady-state period refers to any periods that is not a startup or shutdown period. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-25 The combined total CO emissions form startup, shutdown, and steady state operation shall not exceed 558.8 lb/day. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-26 The VOC emissions during startup and shutdown periods shall not exceed 16.0 lb/hour. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-27 The VOC emissions concentration during steady state operation shall not exceed 1.4 ppmvd @ 15% O2 over a 3 hour rolling average. Steady-state period refers to any periods that is not a startup or shutdown period. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-28 The combined total VOC emissions form startup, shutdown, and steady state operation shall not exceed 83.0 lb/day. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-29 The PM10 emissions rate shall not exceed 7.0 lb/hr and 168.0 lb/day. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-30 The SOx emission rate shall not exceed 1.05 lb/hr and 25.2 lb/day. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-31 Ammonia (NH3) emissions concentration shall not exceed 5 ppmvd @ 15% O2 over a 24 hour rolling average. [CEC BACT Determination]

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-32 Compliance with ammonia emission limit shall be demonstrated utilizing one of the following procedures: 1) calculate the daily ammonia emissions using the following equation: (ppmvd @ 15% O2) = ((a – (b x c/1,000,000)) x (1,000,000 / b)) x d, where a = ammonia injection rate (lb/hr) / (17 lb/lb mol), b = dry exhaust flow rate (lb/hr) / (29 lb/lb mol), c = change in measured NOx concentration ppmvd @ 15 % O2 across the catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip; 2) utilize another District-approved calculation method using measured surrogate parameters to determine

the daily ammonia emissions in ppmvd @ 15% O2. If this option is chosen, the project owner shall submit a detailed calculation protocol for District approval at least 60 days prior to commencement of operation; 3) Alternatively, the project owner may utilize a continuous in-stack ammonia monitor to verify compliance with the ammonia emissions limit. If this option is chosen, the project owner shall submit a monitoring plan for District approval at least 60 days prior to commencement of operation. [District Rule 4102]

Verification: The project owner shall submit to the CPM and APCO ammonia data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**). Additionally, if a District-approved calculation method using surrogate parameters to determine the daily ammonia emissions is used, the project owner shall submit for approval by the CPM and the APCO a detailed calculation protocol at least 60 prior to initial startup. If a continuous in-stack ammonia monitor is used, the project owner shall submit for approval by the CPM and the APCO an ammonia monitoring plan at least 60 days prior to initial startup.

AQ-33 The cumulative annual emissions shall not exceed 101,812 lb/year for CO and 17,404 lb/year for VOC. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-34 The cumulative quarterly NOx emissions from permit units N-2246-3 and N-2246-4 shall not exceed 35,000 lb/quarter. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-35 The cumulative annual NOx emissions from permit units N-2246-3 and N-2246-4 shall not exceed 140,000 lb/year. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-36 Each one hour period shall commence on the hour. Each one hour period in a three hour rolling average will commence on the hour. The three hour average will be compiled from the three most recent one hour periods. Each one hour period in a twenty-four hour average for ammonia slip will commence on the hour. The twenty-four hour average will be calculated starting and ending at twelve-midnight. [District Rule 2201]

Verification: None.

AQ-37 Daily emissions will be compiled for a twenty-four hour period starting and ending at twelve-midnight. Each month in the twelve consecutive month rolling average emissions shall commence at the beginning of the first day of the month. The twelve consecutive month rolling average emissions to determine compliance with annual emissions limitations shall be compiled from the twelve most recent calendar months. [District Rule 2201]

Verification: None.

AQ-38 Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to

any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]

Verification: The project owner shall notify the CPM and the District 30 days prior to any compliance source test. The project owner shall provide a source test plan to the CPM and District for approval fifteen (15) days prior to testing.

AQ-39 Source testing shall be witnessed or authorized by District personnel. [District Rule 1081]

Verification: The project owner shall notify the CPM and the District 30 days prior to any compliance source test.

AQ-40 The results of each source test shall be received by the District no later than 60 days after the source test date. [District Rule 1081]

Verification: Results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-41 Source testing to measure startup NOx, CO, and VOC mass emission rates shall be conducted for one of the gas turbines (N-2246-3 or N-2246-4) prior to the end of the commissioning period and at least once every seven years, thereafter. CEM relative accuracy shall be determined during source testing in accordance with 40 CFR Part 60, Appendix B. If CEM data is not certified to determine compliance with NOx and CO startup emission limits, then source testing to measure startup NOx and CO mass emission rates shall be conducted at least once every 12 months. [District Rules 2201 and 4001]

Verification: The results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-42 Source testing to demonstrate compliance with the NOx (ppmvd), CO (ppmvd), VOC (ppmvd), PM10 (lb/hour), and NH3 (ppmvd) emission limits and fuel gas sulfur content requirements shall be conducted within 60 days of initial operation. Source testing to demonstrate compliance with the NOx (ppmvd), CO (ppmvd), VOC (ppmvd), PM10 (lb/hour), and NH3 (ppmvd) emission limits shall be conducted at least once every twelve months thereafter. [District Rules 2201 and 4001]

Verification: The results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-43 Source testing to determine the percent efficiency of the turbine shall be conducted annually. [District Rule 4703]

Verification: The results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-44 NOx emissions (referenced as NO2) shall be determined using EPA method 7E, EPA method 20, or CARB Method 20. The test results shall be corrected to ISO standard conditions as defined in 40 CFR Part 60 Subpart GG Section 60.335. [District Rules 1081, 2201, 4001, and 4703]

Verification: The project owner shall provide a source test plan demonstrating compliance with this condition to the CPM and APCO for approval fifteen (15) days prior to testing.

AQ-45 VOC emissions (referenced as methane) shall be determined using EPA method 18 or EPA method 25. [District Rules 1081 and 2201]

Verification: The project owner shall provide a source test plan demonstrating compliance with this condition to the CPM and APCO for approval fifteen (15) days prior to testing.

AQ-46 CO emissions shall be determined using EPA method 10 or EPA method 10B. [District Rules 1081, 2201, and 4703]

Verification: The project owner shall provide a source test plan demonstrating compliance with this condition to the CPM and APCO for approval fifteen (15) days prior to testing.

AQ-47 Source testing to measure concentrations of PM10 shall be conducted using EPA methods 201 and 202, or EPA methods 201A and 202, or CARB method 501 in conjunction with CARB method 5. Alternative source testing methods will be allowed provided prior written approval is received from both the District and the EPA. [District Rules 1081 and 2201]

Verification: The project owner shall provide a source test plan demonstrating compliance with this condition to the CPM and APCO for approval fifteen (15) days prior to testing.

AQ-48 Ammonia (NH3) emissions shall be determined using BAAQMD Method ST-1B. [District Rules 1081 and 4102]

Verification: The project owner shall provide a source test plan demonstrating compliance with this condition to the CPM and APCO for approval fifteen (15) days prior to testing.

AQ-49 Oxygen content of the exhaust gas shall be determined using EPA method 3, EPA method 3A, or EPA method 20. [District Rules 1081, 2201, and 4703]

Verification: The project owner shall provide a source test plan demonstrating compliance with this condition to the CPM and APCO for approval fifteen (15) days prior to testing.

AQ-50 If necessary, testing for fuel sulfur content shall be conducted utilizing ASTM Method D 3246, ASTM Method D1072-90, ASTM Method D4468-85, ASTM Method D5504-94 or ASTM Method D3246-81. [District Rules 1081 and 4001]

Verification: The project owner shall provide a source test plan demonstrating compliance with this condition to the CPM and APCO for approval fifteen (15) days prior to testing.

AQ-51 Source testing to determine the percent efficiency of the turbine shall be conducted utilizing the procedures in District Rule 4703 (Stationary Gas Turbines). [District Rule 4703]

Verification: The project owner shall provide a source test plan demonstrating compliance with this condition to the CPM and APCO for approval fifteen (15) days prior to testing.

AQ-52 The project owner shall maintain the following records: the date, time and duration of any malfunction of the continuous monitoring equipment; dates of performance testing; dates of evaluations, calibrations, checks, and adjustments of the continuous monitoring equipment; date and time period which a continuous monitoring system or monitoring device was inoperative. [District Rules 2201 and 4703]

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

AQ-53 The project owner shall maintain a daily record that includes the actual turbine startup and stop times (local time), total hours of operation, and the quantity and type of fuel used. [District Rule 4703]

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

AQ-54 The project owner shall retain records of the cumulative annual NOx, CO, and VOC emissions. The record shall be updated daily. [District Rule 2201]

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

AQ-55 The project owner shall maintain hourly records of NOx, CO, and ammonia concentrations (ppmv @ 15% O2). [District Rules 2201 and 4201]

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

AQ-56 The project owner shall submit a written report for each calendar quarter to the APCO. The report shall be received by the District within 30 days of the end of the quarter and shall include: time intervals and the magnitude of excess emissions, the nature and cause of excess emissions (if known), corrective actions taken and preventive measures adopted; averaging period used for data reporting corresponding to the averaging period specified in the emission test period used to determine compliance with an emission standard for the pollutant/source category in question; time and date of each period during which a continuous monitoring system was inoperative except for zero and span checks and the nature of system repairs and adjustments; a negative declaration when no excess emissions occurred. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO the excess emissions and other data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-57 The project owner shall provide notification and record keeping as required under 40 CFR, Part 60, Subpart A, 60.7. [District Rule 4001]

Verification: The project owner shall comply with the notification and record keeping requirements specified under 40 CFR, Part 60, Subpart A, 60.7. The project owner shall make records available for inspection by representatives of the District, CARB and the Commission upon request.

AQ-58 Operator shall submit a semiannual report to the APCO listing any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeded 0.8% by weight. [District Rule 4001]

Verification: The project owner shall submit to the CPM and APCO the sulfur content data as necessary to comply with this condition as part of every other Quarterly Operational Report (**AQ-C7**).

AQ-59 All records required to be maintained by this permit shall be maintained for a period of five years and shall be made readily available for District inspection upon request. [District Rule 2201]

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

AQ-60 The project owner shall submit an application to comply with Rule 2540 - Acid Rain Program at least 24 months prior to the date that the unit commences operation. [District Rule 2540]

Verification: The project owner shall submit to the CPM copies of the Title IV permit and proof that necessary Title IV SO_2 emission allotments have been acquired at least fifteen (15) days prior to the initial firing of the turbine(s).

AQ-61 Project owner shall notify the District of any breakdown condition as soon as reasonably possible, but no later than one hour after its detection, unless the owner or operator demonstrates to the District's satisfaction that the longer reporting period was necessary. [District Rule 1100]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM and the APCO as part of the Quarterly Operational Report (**AQ-C7**).

AQ-62 The District shall be notified in writing within ten days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the methods utilized to restore normal operations. [District Rule 1100]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the Quarterly Operational Report (**AQ-C7**).

AQ-63 The owner/operator shall minimize the emissions from the gas turbine and heat recovery steam generator to the maximum extent possible during the commissioning period. Conditions **AQ-63** through **AQ-75** shall apply only during the commissioning period as defined below. [District Rule 2201]

Verification: The project owner shall provide in the monthly commissioning status report (see the verification for Condition **AQ-69**) information regarding the types and effectiveness of methods used to minimize commissioning period emissions.

AQ-64 Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable steady

state operation of the gas turbines, heat recovery steam generators, steam turbine and associated electrical delivery systems. [District Rule 2201]

Verification: None.

AQ-65 Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a gas turbine is first fired, whichever occurs first. The commissioning period shall terminate when the plant has completed initial performance testing, and is available for commercial operation. [District Rule 2201]

Verification: None.

AQ-66 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the combustors of this unit shall be tuned to minimize emissions. [District Rule 2201]

Verification: The project owner shall provide combustor tuning information to demonstrate compliance with this condition, and that information shall be submitted to the CEC CPM as part of the monthly commissioning status report noted in the verification of Condition **AQ-69**.

AQ-67 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Selective Catalytic Reduction (SCR) system and the oxidation catalyst shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

Verification: The project owner shall provide emission abatement system information (such as dates of catalyst installation and ammonia grid initial operation) to demonstrate compliance with this condition, and that information shall be submitted to the CEC CPM as part of the monthly commissioning status report noted in the verification of Condition **AQ-69**.

AQ-68 Coincident with the steady-state operation of the SCR system and the oxidation catalyst, NOx and CO emissions from this unit shall comply with the limits specified in condition **AQ-19** and **AQ-24**. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition, and that data shall be submitted to the CEC CPM as part of the monthly commissioning status report noted in the verification of Condition **AQ-69**.

AQ-69 The owner/operator shall submit a plan to the District at least four weeks prior to the first firing of this unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours and the purpose of the activity. The activities described shall include, but not limited to the following: tuning of the combustors, installation and operation of the SCR systems and the oxidation catalyst, installation, calibration and testing of the NOx and CO continuous emissions monitors and any activities requiring the firing of this unit without abatement by the SCR system or oxidation catalyst. [District Rule 2201]

Verification: The project owner shall submit a single commissioning plan to the District and the CPM at least four weeks prior to the first firing of any combustion turbine, describing in detail the procedures to be followed for each turbine. The project owner shall submit, commencing one month from the time of gas turbine first fire, a monthly commissioning status report throughout the duration of the commissioning phase that demonstrates compliance with the commissioning plan and demonstrates compliance with all other substantive requirements listed in Conditions **AQ-63** through **AQ-75**. The monthly commissioning status report shall be submitted to the CPM monthly within ten (10) days of the numeric calendar day of turbine first fire date.

AQ-70 The emission rates during the commissioning period shall not exceed any of the following: NOx (as NO2) – 108.8 lb/hr, CO – 180.0 lb/hr, VOC (as methane) – 17.0 lb/hr, SOx – 0.94 lb/hr, and PM10 – 7.0 lb/hr. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition, and that data shall be submitted to the CEC CPM as part of the monthly commissioning status report noted in the verification of Condition **AQ-69**.

AQ-71 Only one of the turbines under permits N-2246-3 and N-2246-4 shall be operated at any one time without abatement and only during commissioning. Combined emission rates from permit units N-2246-3 and N-2246-4, during the commissioning period, shall not exceed any of the following limits: NOx (as NO2) – 227.8 lb/hr or 3,055.4 lb/day; CO – 309.0 lb/hr or 4,878.8 lb/day; VOC (as methane) – 33.0 lb/hr or 491 lb/day; SOx – 336.0 lb/day; PM_{10} – 47.8 lb/day. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition, and that data shall be submitted to the CEC CPM as part of the monthly commissioning status report noted in the verification of Condition **AQ-69**.

AQ-72 During the commissioning period, the project owner shall demonstrate compliance with conditions **AQ-70** and **AQ-71** through the use of properly operated and maintained continuous emissions monitors and recorders as specified in these permit conditions. The monitored parameters for this unit shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the source is not in operation). [District Rule 2201]

Verification: The project owner shall provide CEM data to demonstrate compliance with conditions **AQ-70** and **AQ-71**, and that data shall be submitted to the CEC CPM as part of the monthly commissioning phase status report noted in the verification of Condition **AQ-69**.

AQ-73 The continuous monitors specified in these permit conditions shall be installed, calibrated, and operational prior to the first firing of the unit. After first firing, the detection range of the CEMS shall be adjusted as necessary to accurately measure the resulting range of NOx and CO emission concentrations. [District Rule 2201]

Verification: The project owner shall provide notification to the District and the CPM of the anticipated dates for installation, calibration and testing for the CEMS at least ten (10) days prior to installation. The project owner shall provide a report to the District and CPM for approval demonstrating compliance with CEMS calibration

requirements prior to turbine first fire. The project owner shall provide ongoing calibration data in the monthly commissioning status reports (see verification of Condition **AQ-69**).

AQ-74 The total number of firing hours of this unit without abatement of emissions by the SCR system and the oxidation catalyst shall not exceed 288 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and the oxidation catalyst in place. Upon completion of these activities, the project owner shall provide written notice to the District and the unused balance of the 288 firing hours without abatement shall expire. [District Rule 2201]

Verification: The project owner shall provide to the District and the CPM a reporting of the unused balance of the 288 firing hours without abatement for each turbine in the monthly commissioning status reports (see verification of Condition **AQ-69**).

AQ-75 The total mass emissions of NOx, CO, and VOC that are emitted during the commissioning period shall accrue towards the annual emission limits specified in conditions **AQ-33** and **AQ-35**. [District Rule 2201]

Verification: None.

SJVACPD Permit No. UNIT N-2246-5-0: 68,500 GPM MECHANICAL DRAFT COOLING TOWER WITH 5 CELLS SERVED BY HIGH EFFICIENCY DRIFT ELIMINATOR.

Conditions of Certification AQ-76 through AQ-80 apply to the cooling tower.

AQ-76 No hexavalent chromium containing compounds shall be added to cooling tower circulating water. [District Rule 7012]

Verification: The project owner shall provide the list of cooling tower water additives (i.e. biocides, fungicides, anti-scaling compounds, etc.) demonstrating compliance with this condition to the CPM for approval at least 30 days prior to operation of the cooling tower and shall provide any revisions to the cooling tower water additives list to the CPM for approval prior using the new water additive.

AQ-77 Drift eliminator drift rate shall not exceed 0.0005%. [District Rule 2201]

Verification: The project owner shall provide copies of cooling tower and drift eliminator design details to the CPM and the District for approval at least 30 days prior to construction of permanent foundations for the cooling tower.

AQ-78 The PM10 emissions shall not exceed 30.8 lb/day. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO the cooling tower emission data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-79 Compliance with the PM10 emission limit shall demonstrated as follows: PM10 lb/day = Circulating Water Recirculation rate (gal/day) x 8.34 lb/gal

x Total Dissolved Solids Concentration in the blowdown water (ppm) x Design Drift Rate (%). [District Rule 2201]

Verification: None.

AQ-80 Compliance with PM10 emission limit shall be determined by blowdown water sample analysis by independent laboratory within 60 days of initial operation and quarterly thereafter. [District Rule 1081]

Verification: The results and field data collected from cooling tower blowdown water samples analysis shall be submitted to the CPM and the District as part of the Quarterly Operational Report (**AQ-C7**).

SJVACPD Permit No. UNIT N-2246-5-0: 300 HP JOHN DEERE COMPANY MODEL JW6H-UF40 DIESEL-FIRED EMERGENCY IC ENGINE POWERING A FIRE PUMP.

Conditions of Certification AQ-81 through AQ-88 apply to the emergency fire pump engine.

AQ-81 The exhaust stack shall not be fitted with a rain cap, or any other similar device, that impedes upward vertical exhaust flow. [District Rule 4102]

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

AQ-82 The NOx emissions from the engine shall not exceed 5.2 grams/hp-hr. [District Rule 2201]

Verification: The project owner shall provide to the CPM and APCO, 30 days prior to installation of the fire pump engine, manufacturer emissions guarantee data demonstrating compliance with this condition.

AQ-83 The CO emissions from the engine shall not exceed 0.27 grams/hp-hr. [District Rule 2201]

Verification: The project owner shall provide to the CPM and APCO, 30 days prior to installation of the fire pump engine, manufacturer emissions guarantee data demonstrating compliance with this condition.

AQ-84 The VOC emissions from the engine shall not exceed 0.15 grams/hp-hr. [District Rule 2201]

Verification: The project owner shall provide to the CPM and APCO, 30 days prior to installation of the fire pump engine, manufacturer emissions guarantee data demonstrating compliance with this condition.

AQ-85 The PM10 emissions from the engine shall not exceed 0.09 g/hp-hr based on U.S. EPA certification testing using test procedure ISO 8178. [District Rule 2201]

Verification: The project owner shall provide to the CPM and APCO, 30 days prior to installation of the fire pump engine, manufacturer emissions guarantee data demonstrating compliance with this condition.

AQ-86 Only CARB certified fuel containing not more than 0.05% sulfur by weight is to be used in this engine. [District Rule 2201]

Verification: The project owner shall make fuel purchase, MSDS or other fuel supplier records containing diesel fuel sulfur content available for inspection by representatives of the District, CARB and the Commission upon request.

AQ-87 The engine shall be operated only for maintenance, testing, required regulatory purposes and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 100 hours per year. [District Rules 2201 and 4102]

Verification: The project owner shall submit to the CPM and APCO the fire pump engine operations data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-C7**).

AQ-88 The project owner shall maintain records of hours of emergency and non-emergency operation. Records shall include the date, the number of hours of operation, the purpose of the operation (e.g., load testing, weekly testing, rolling blackout, general area power outage, etc.), and the sulfur content of the diesel fuel used. Such records shall be made available for District inspection upon request for a period of five years. [District Rule 1070]

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

Conditions of Certification AQ-89 through AQ-108 are SJVACPD General Facility Permit Conditions

AQ-89 The permitee shall not begin actual onsite construction of the equipment authorized by this Authority to Construct until the lead agency satisfies the requirements of the California Environmental Quality Act (CEQA). [California Environmental Quality Act]

Verification: The project owner shall keep proof of the project's District air permit and CEC certification, including copies of all permit conditions and Conditions of Certification, onsite starting at the commencement of construction through the final decommissioning of the project. The project owner shall make the District's permit conditions and Conditions of Certification available at the project site to representatives of the District, California Air Resource Board (CARB) and the Energy Commission for inspection.

AQ-90 All equipment shall be maintained in proper operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District NSR Rule]

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

AQ-91 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

Verification: The project owner will document any complaints that it has received from the public in the Quarterly Operational Report (**AQ-C7**). The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-92 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner shall submit the results of the initial and annual source tests per Condition **AQ-41**.

AQ-93 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

Verification: The project owner shall document any known opacity violations in the Quarterly Operational Report (**AQ-C7**). The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-94 Prior to operating equipment under this Authority to Construct, the project owner shall surrender NOx emission reduction credits for the following quantities of emissions: 1st quarter – 35,000 lb, 2nd quarter – 35,000 lb, 3rd quarter – 35,000 lb, and fourth quarter – 35,000 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 4/25/02). [District Rule 2201]

Verification: At least 60 days prior to commencing turbine first fire, the project owner shall surrender ERC certificates in the amounts shown to the District and provide documentation of that surrender to the CPM.

AQ-95 ERC Certificate Numbers C-482-2 and S-1834-2 shall be used to supply the required NOx offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

Verification: At least 60 days prior to commencing turbine first fire, the project owner shall surrender the identified ERC certificates and in the amounts shown in **AQ-94** to the District and provide documentation of that surrender to the CPM. Changes to the offsetting proposal must be provided to the District and CPM for review, public noticing, and approval.

AQ-96 Prior to operating equipment under this Authority to Construct, the project owner shall surrender VOC emission reduction credits for the following quantities of emissions: 1st quarter – 13,053 lb, 2nd quarter – 13,053 lb, 3rd quarter – 13,053 lb, and fourth quarter – 33,053 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 4/25/02). [District Rule 2201]

Verification: At least 60 days prior to commencing turbine first fire, the project owner shall surrender ERC certificates in the amounts shown to the District and provide documentation of that surrender to the CPM.

AQ-97 ERC Certificate Number C-484-1 shall be used to supply the required VOC offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

Verification: At least 60 days prior to commencing turbine first fire, the project owner shall surrender the identified ERC certificates and in the amounts shown in **AQ-96** to the District and provide documentation of that surrender to the CPM. Changes to the offsetting proposal must be provided to the District and CPM for review, public noticing, and approval.

AQ-98 Prior to operating equipment under this Authority to Construct, the project owner shall surrender PM10 emission reduction credits for the following quantities of emissions: 1st quarter – 36,104 lb, 2nd quarter – 36,104 lb, 3rd quarter – 36,104 lb, and fourth quarter – 36,104 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 4/25/02). [District Rule 2201]

Verification: At least 60 days prior to commencing turbine first fire, the project owner shall surrender ERC certificates in the amounts shown to the District and provide documentation of that surrender to the CPM.

AQ-99 ERC Certificate Numbers C-486-4 C-488-4, C-491-4, C-494-4, C-495-4, N-333-4. N-334-4, N-335-4, and N-336-4 shall be used to supply the required PM10 offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

Verification: At least 60 days prior to commencing turbine first fire, the project owner shall surrender the identified ERC certificates and in the amounts shown in **AQ-98** to the District and provide documentation of that surrender to the CPM. Changes to the offsetting proposal must be provided to the District and CPM for review, public noticing, and approval.

AQ-100 Project owner shall submit an application to comply with Rule 2520 - Federally Mandated Operating Permits prior to the implementation of this Authority to Construct to a Permit to Operate. [District Rule 2520]

Verification: The project owner shall submit a copy of their Title V – Federal Mandated Operating Permit Application to the CPM within 12 months of commencing operation.

AQ-101 Authority to Construct permits N-2246-3-0, N-2246-4-0, N-2246-5-0, N-2246-1-4, and N-2246-2-4 shall be implemented simultaneously. [District Rule 2201]

Verification: None.

AQ-102 Disturbances of soil related to any construction, demolition, excavation, extraction, and other earthmoving activities shall comply with the requirements

for fugitive dust control in SJVUAPCD District Rule 8021 (11/15/01) unless specifically exempted under section 4.0 of Rule 8021. [District Rule 8021]

Verification: The project owner shall document compliance with Rule 8021 in the Monthly Compliance Report, and as necessary after construction is complete in the Quarterly Operational Report (**AQ-C7**).

AQ-103 Outdoor handling, storage, and transport of any bulk material shall comply with the requirements of SJVUAPCD District Rule 8031 (11/15/01), unless specifically exempted under section 4.0 of Rule 8031. [District Rule 8031]

Verification: The project owner shall document compliance with Rule 8031 in the Monthly Compliance Report, and as necessary after construction is complete in the Quarterly Operational Report (**AQ-C7**).

AQ-104 All sites that are subject to SJVUAPCD District Rule 8021, SJVUAPCD District Rule 8031, and SJVUAPCD District Rule 8071 shall comply with the requirements of SJVUAPCD District Rule 8041 (11/15/01), unless specifically exempted under section 4.0 of Rule 8041. [District Rule 8041]

Verification: The project owner shall document compliance with Rule 8041 in the Monthly Compliance Report, and as necessary after construction is complete in the Quarterly Operational Report (**AQ-C7**).

AQ-105 Any open area having 3.0 acres or more of disturbed surface area, that has remained undeveloped, unoccupied, unused or vacant for more than seven days shall comply with the requirements of SJVUAPCD District Rule 8051 (11/15/01), unless specifically exempted under section 4.0 of Rule 8051. [District Rule 8051]

Verification: The project owner shall document compliance with Rule 8051 in the Monthly Compliance Report, and as necessary after construction is complete in the Quarterly Operational Report (**AQ-C7**).

AQ-106 Any new or existing public or private paved or unpaved road, road construction project, or road modification project shall implement the control measures and design criteria of, and comply with the requirements of SJVUAPCD District Rule 8061 (11/15/01) unless specifically exempted under section 4.0 of Rule 8061. [District Rule 8061]

Verification: The project owner shall document compliance with Rule 8061 in the Monthly Compliance Report, and as necessary after construction is complete in the Quarterly Operational Report (**AQ-C7**).

AQ-107 Any unpaved vehicle/equipment traffic area of 1.0 acre or larger shall comply with the requirements of SJVUAPCD District Rule 8071 (11/15/01), unless specifically exempted under section 4.0 of Rule 8071. [District Rule 8071]

Verification: The project owner shall document compliance with Rule 8071 in the Monthly Compliance Report, and as necessary after construction is complete in the Quarterly Operational Report (**AQ-C7**).

AQ-108 Any off-field agricultural sources shall comply with the requirements of SJVUAPCD District Rule 8081 (11/15/01), unless specifically exempted under section 4.0 of Rule 8081. [District Rule 8081]

Verification: The project owner shall document compliance with Rule 8081 in the Monthly Compliance Report, and as necessary after construction is complete in the Quarterly Operational Report (**AQ-C7**).

REFERENCES

CARB (California Air Resources Board). 1999. Guidance for Power Plant Siting and Best Available Control Technology. Issued September 1999.

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MDEP (Massachusetts Dept. of Environmental Protection), 2003. Other LAER/BACT Determination, Application No. 118969, Equipment Category: Gas Turbine. January 9, 2003.

Turlock Irrigation District. TID 2002a. Application for Certification, Walnut Energy Center (02-AFC-4). Submitted to the California Energy Commission, November 18, 2002.

Turlock Irrigation District. TID 2002b. Data Adequacy Supplement, Application for Certification, Walnut Energy Center (02-AFC-4). Submitted to the California Energy Commission, December 12, 2002.

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SCAQMD (South Coast Air Quality Management District). 1993. CEQA Air Quality Handbook. November, 1993 Update.

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– Walnut Energy Center Project - PDOC. Received by the California Energy Commission on April 25, 2003.

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AIR QUALITY ATTACHMENT A
STAFF CONSTRUCTION EMISSION ESTIMATE

INTRODUCTION

Staff found a number of issues with the applicant's construction emission estimate, including: calculation errors, improper calculation assumptions, and the use of emission assumptions that did not match the applicant's proposed mitigation measures. Staff has revised/corrected the construction emission calculations and used the results in a revised modeling analysis.

EMISSION CALCULATION CORRECTIONS AND ASSUMPTION REVISIONS

EMISSION CALCULATION CORRECTIONS

The applicant's unpaved road dust emission calculations do not properly use the soil moisture content and the soil silt content in the emission factor equation. These values are supposed to be used in the equation as percentiles; however, they have been linked into the calculation in a manner that causes them to be read as a fraction rather than percentile (i.e. 0.05 rather than 5%) and this causes a significant underestimation of the unpaved road dust emission factors. An example is shown below:

$$E = (k)[(s/12)^{0.8}][(W/3)^{0.4}]/[(M/0.2)^{0.3}] = \text{lbs/Vehicle Mile Traveled (VMT)}$$

Where: K = 2.6 (constant)
S = 8.5% (silt content – applicant assumption)
W = 24.7 tons (water truck assumption)
M = 3.4% (moisture content – pre-control assumption)

Applicant Calculation:

$$E = (2.6)[(0.085/12)^{0.8}][(24.7/3)^{0.4}]/[(0.034/0.2)^{0.3}] = 0.1960 \text{ lbs/VMT}$$

Correct Calculation:

$$E = (k)[(8.5/12)^{0.8}][(24.7/3)^{0.4}]/[(3.4/0.2)^{0.3}] = 1.96 \text{ lbs/VMT}$$

The applicant's calculation error caused the underestimation of the unpaved road dust emissions by a factor of 10 for all equipment items (100^0.8/100^0.3 = 100^0.5 = 10).

Staff has also corrected the unpaved road dust emission calculations and has included a slow traffic speed multiplier (7.5/15 mph) to correct the equations for the traffic speed limits that will be recommended to be imposed on the site during construction.

EMISSION ASSUMPTION REVISIONS

The following tables provides a comparison of the applicant's original calculation assumptions.

Fugitive Dust Emission Calculation Assumptions

Variable	Applicant	Staff	Rationale
Paved Road Silt Loading	0.015 g/m^2	1.4 g/m^2	The paved road silt loading assumption used by the applicant is not consistent with a construction site. Staff used the SCAQMD CEQA Handbook factor for construction site roads that have road sweeping/washing.
Wind Erosion Calculation	20 days/mo	30 days/mo	Wind erosion in disturbed areas occurs every day, not just days with active construction. Also, this does not change the overall wind emissions; it just lowers the daily emissions assumption.
Finish Grading Speed	3.0 mph	7.1 mph	Staff basis is from AP-42 Table 11.9-3. The applicant's is noted to be an estimate; however, this estimate is inconsistent with the use of equations from Section 11.9, which are based on the speeds listed in Table 11.9-3.
Soil Moisture Content	7.9% - dry	3.4% - dry 15% - wet	The applicant revised the dry soil moisture content after staff comment. The wet (i.e. controlled) soil moisture content is being used by staff to determine controlled emission factors. These factors are for dry and moist soils given in the SCAQMD CEQA Handbook. The 7.9% value used by the applicant was not consistent with exposed dry surface soils.
Soil Silt Content	6.9% and 8.5%	8.5%	Staff's review of the silt content's used by the applicant indicate that the 8.5% value is likely better for the Dinuba soils than the 6.9% value and staff believes the value used should be consistent.
Scraper Assumptions	615E and 651E	615E	The applicant indicated that the engine emission assumptions were for 615E scrapers, but their fugitive dust calculations assumed 651E scrapers. Staff lowered the fugitive dust assumptions (weight and haul tonnage) to be consistent with a 615E scraper. The haul tonnage is also used to determine the daily soil transfer weight (scraper haul tonnage *0.25), so these throughput assumption factors also were lowered by changing the scraper type. The hauling distance and number of loads estimated were not changed.
Average Wind Speed	4.66 m/s	3.55 m/s	Staff corrected the average wind speed using the Modesto meteorological data.
Loader Assumptions	916 and 966E	916	The applicant indicated that the engine emission assumptions were for 916 loaders, but their fugitive dust calculations assumed 966E loaders. Staff lowered the fugitive dust assumptions (equipment weight and bucket capacity) to be consistent with a 916 loader.
Excavator Assumptions	E110 and 225D	E110	The applicant indicated that the engine emission assumptions were for E110 excavators, but their fugitive dust calculations assumed 225D excavators. Staff lowered the fugitive dust assumptions (excavating rate) to be consistent with an E110 excavator.
Evaporation rate	0.423 mm/hr	0.464 mm/hr	The evaporation rate was corrected to assume that the evaporation rate is 80 inches per year in the site area and that the evaporation occurs during the daylight hours (12 hours/day). The maximum evaporation rate in the summer would actually be much higher.
Vehicles per hour	25 to 50	37	Staff selected an average value.
Application intensity	0.7 l/m^2 to 2.26 l/m^2	0.7 l/m^2	Staff selected the value that is consistent with that indicated as an average value in the reference source of the emission control equation. The applicant has mixed their reference sources; staff does not feel that this is appropriate as the control efficiency equation developed by the first source may have been different at higher application intensities.
Active Construction Area	816,927 sq.ft.	1,609,711.5 sq.ft.	The applicant has modeled their emissions using 37-acre area sources but only assumed that the active construction area was 18.75 acres. Staff determined that these assumptions should be consistent and made the active construction area to be equal to the size of the area source being modeled.

Equipment Tailpipe Emission Assumptions

Variable	Applicant	Staff	Rationale
Nonroad Mobile Equipment PM_{10} Emission Factor	0.3 g/bhp	0.4 to 1.6 g/bhp	The applicant has assumed emission factors that are inconsistent with their proposed level of mitigation. They have indicated that they will use equipment that meets federal emission standards for construction equipment "if available". The term "if available" would allow the applicant to claim that any or all equipment types that meet federal emission standards could not be found. Additionally, only equipment that is greater than 175 hp has Tier 1 standards and the Tier 2 standards for equipment less than 175 hp is not required until 2003 and 2004 model years. Additionally, the assumption of 0.3 g/bhp is inconsistent with the Tier 1 standard of 0.4 g/bhp for equipment larger than 175 hp. Staff assumed that equipment larger than 175 hp met the Tier 1 standard and equipment smaller than 175 hp was consistent with fleet average emission factors provided by EPA's 1991 Non-road Engine and Vehicle Emission Study Report.
Nonroad Mobile Equipment VOC Emission Factor	0.4 g/bhp	0.3 to 1.57 g/bhp	Same general rationale and method as above.
Nonroad Mobile Equipment CO Emission Factor	1 g/bhp	3.1 to 9.1 g/bhp	Same general rationale and method as above; however, in this case the 1 g/bhp value used by the applicant cannot be said to be based on the nonroad diesel standards as indicated by the applicant. The lowest Tier 2 CO standard is 2.6 g/bhp.
Diesel Sulfur Content	0.05% and 0.0015%	0.05%	The applicant identified the use of CARB low sulfur fuels as their mitigation method but then used ultra-low sulfur fuel as their emission assumption. Staff corrected their emission assumption to be consistent with their proposed mitigation.
Number of Units	Based on annual average	Based on maximum 12-month period	Staff revised the annual emissions to use the average equipment units from months 7 to 18 (i.e. the maximum 12-month period) rather than an average of the entire construction period, which underestimates the worst-case annual emissions by averaging in very low activity months at the end of the construction.

Staff determined that the silt content assumption for gravel roads used by the applicant was 6.5 percent, but did not have time to determine if that was a reasonable value. Staff did not revise the NO_x emission factor assumptions, but would like to note that this assumption means that all nonroad mobile equipment would have to meet EPA Tier 1 NO_x standards. Additionally, staff did not change the assumed equipment types or activity levels estimated by the applicant for the exhaust emissions; however, staff is not sure that these equipment types and activity levels provide realistic worst-case daily or annual emission assumptions.

The revised emission estimates are as follows:

Staff Estimate - Maximum On-Site Construction Emissions

	NO_x	CO	VOC	SO_x	PM_{10}
Maximum Daily Emissions (lbs/day)					
Construction Equipment	136.13	64.92	10.69	0.12 [a]	6.36
Fugitive Dust	---	---	---	---	65.76
Maximum Annual Emissions (tons/yr)					
Construction Equipment	31.71	379.11	30.27	0.02	0.64
Fugitive Dust	19.61	12.27	1.76	0.81	1.10

Attached are staff's revised versions of the applicant's construction emission tables and the fugitive dust emission calculations.

MODELING ANALYSIS REVISIONS

The applicant assumed that the emissions were distributed evenly over a 37-acre area. Staff revised the modeling to use 17 point and 17 volume sources to model the equipment tailpipe and equipment fugitive dust emissions. These sources were distributed over the entire active construction area, but 13 of the 17 were distributed within the ~18 acres of the WEC building area and four were distributed in the outlaying support areas (i.e. laydown, waste and refueling areas). The wind blown dust modeling procedure was not revised.

Construction Equipment Daily Exhaust Emissions (Month 7)
Turlock Irrigation District Walnut Energy Center

Equipment	Gasoline/ Diesel	Number of Units	Hrs/Day Per Unit	Gals/Hr Per Unit	Total Fuel Use (Gals/day)	Emission Factors (lbs/1000 gals)(1) NOx	CO	POC	SOx	PM10	Daily Emissions (lbs/day) NOx	CO	POC	SOx	PM10
Crawler Crane- Greater than 300 ton	D	0	2	7.50	0.00	270.01	101.74	49.31	7.10	5.87	0.00	0.00	0.00	0.00	0.00
Crawler Crane- Greater than 200 ton	D	0	4	5.00	0.00	270.01	164.35	39.13	7.10	15.65	0.00	0.00	0.00	0.00	0.00
Crane - Mobile 65 ton	D	0	4	4.00	0.00	270.01	164.35	39.13	7.10	15.65	0.00	0.00	0.00	0.00	0.00
Cranes -Mobile 45 ton	D	0	4	4.00	0.00	270.01	164.35	49.31	7.10	56.35	0.00	0.00	0.00	0.00	0.00
Cranes - Mobile 35 ton	D	0	4	4.00	0.00	270.01	164.35	49.31	7.10	56.35	0.00	0.00	0.00	0.00	0.00
Bulldozer D6H	D	1	8	5.50	44.00	270.01	187.83	49.31	7.10	43.44	11.88	8.26	2.17	0.31	1.91
Bulldozer D4C	D	1	8	3.00	24.00	270.01	187.83	49.31	7.10	43.44	6.48	4.51	1.18	0.17	1.04
Excavator- Trencher	D	0	8	2.00	0.00	270.01	357.66	60.26	7.10	56.35	0.00	0.00	0.00	0.00	0.00
Excavator- Earth Scraper	D	3	8	9.00	216.00	270.01	195.66	39.13	7.10	15.65	58.32	42.26	8.45	1.53	3.38
Excavator-Motor Grader	D	1	8	5.00	40.00	270.01	148.70	60.26	7.10	39.13	10.80	5.95	2.41	0.28	1.57
Excavator- Backhoe/loader	D	0	8	2.50	0.00	270.01	266.09	54.78	7.10	41.09	0.00	0.00	0.00	0.00	0.00
Excavator - loader	D	1	8	2.50	20.00	270.01	187.83	32.87	7.10	50.48	5.40	3.76	0.66	0.14	1.01
Vibratory Roller	D	1	8	10.00	80.00	270.01	121.31	11.74	7.10	30.52	21.60	9.70	0.94	0.57	2.44
Portable Compaction roller	D	0	8	10.00	0.00	270.01	121.31	39.13	7.10	15.65	0.00	0.00	0.00	0.00	0.00
Truck- Water	D	1	8	3.13	25.04	170.68	106.79	15.33	7.10	9.59	4.27	2.67	0.38	0.18	0.24
Forklift	D	1	4	2.50	10.00	270.01	237.14	61.44	7.10	62.61	2.70	2.37	0.61	0.07	0.63
Dump Truck	D	2	8	3.13	50.08	170.68	106.79	15.33	7.10	9.59	8.55	5.35	0.77	0.36	0.48
Service Truck- 1 ton	D	0	8	1.56	0.00	74.40	59.47	5.57	7.10	4.83	0.00	0.00	0.00	0.00	0.00
Truck- Fuel/Lube	D	1	2	3.13	6.26	170.68	106.79	15.33	7.10	9.59	1.07	0.67	0.10	0.04	0.06
Concrete Pumper Truck	D	0	8	3.13	0.00	170.68	106.79	15.33	7.10	9.59	0.00	0.00	0.00	0.00	0.00
Tractor Truck 5th Wheel	D	0	8	3.13	0.00	170.68	106.79	15.33	7.10	9.59	0.00	0.00	0.00	0.00	0.00
Trucks- Pickup 3/4 ton	G	2	8	0.78	12.48	62.81	677.30	46.28	0.27	1.56	0.78	8.45	0.58	0.00	0.02
Trucks- 3 ton	D	1	8	1.56	12.48	74.40	59.47	5.57	7.10	4.83	0.93	0.74	0.07	0.09	0.06
Diesel Powered Welder	D	0	4	1.27	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Light Plants	D	0	8	1.27	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Portable Compaction- Vibratory Plate	D	0	8	0.25	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Portable Compaction- Vibratory Ram	D	0	8	0.25	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Articulating Boom Platforms	D	0	8	0.25	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Pumps	G	2	8	0.13	2.03	79.44	13813.38	748.58	0.27	2.35	0.16	28.07	1.52	0.00	0.00
Air Compressor 185 CFM	D	1	8	1.27	10.16	313.05	195.66	46.96	7.10	39.13	3.18	1.99	0.48	0.07	0.40
Air Compressor 750 CFM	D	0	8	1.27	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Concrete Vibrators	D	0	8	0.25	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Concrete Trowel Machine	D	0	0.8	1.27	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Fusion Welder	D	0	8	1.27	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Portable Power Generators	D	0	8	1.27	0.00	313.05	195.66	46.96	7.10	39.13	0.00	0.00	0.00	0.00	0.00
Total											136.13	124.76	20.32	3.82	13.24
Total for Gasoline-Powered Eqt											0.95	36.52	2.10	0.00	0.02
Total for Diesel-Powered Eqt											135.18	88.24	18.22	3.82	13.22

Construction Equipment Annual Exhaust Emissions
Turlock Irrigation District Walnut Energy Center

Equipment	Gasoline/ Diesel	Number of Units Per Year	Average Operating Hrs/Day Per Unit	Gals/Hr Per Unit	Average Operating Days per Year	Total Fuel Use (Gals/yr)	Emission Factors (lbs/1000 gals)(2) NOx	CO	POC	SOx	PM10	Annual Emissions (tons/yr) NOx	CO	POC	SOx	PM10
Crawler Crane- Greater than 300 ton	D	0.75	2	7.50	250	2,813	270.01	101.74	49.31	7.10	5.87	0.38	0.14	0.07	0.01	0.01
Crawler Crane- Greater than 200 ton	D	1.00	4	5.00	250	5,000	270.01	164.35	39.13	7.10	15.65	0.68	0.41	0.10	0.02	0.04
Crane - Mobile 65 ton	D	0.92	4	4.00	250	3,667	270.01	164.35	39.13	7.10	15.65	0.50	0.30	0.07	0.01	0.03
Cranes -Mobile 45 ton	D	0.58	4	4.00	250	2,333	270.01	164.35	49.31	7.10	56.35	0.32	0.19	0.06	0.01	0.07
Cranes - Mobile 35 ton	D	1.17	4	4.00	250	4,667	270.01	164.35	49.31	7.10	56.35	0.63	0.38	0.12	0.02	0.13
Bulldozer D6H	D	0.25	8	5.50	250	2,750	270.01	187.83	49.31	7.10	43.44	0.37	0.26	0.07	0.01	0.06
Bulldozer D4C	D	0.33	8	3.00	250	2,000	270.01	187.83	49.31	7.10	43.44	0.27	0.19	0.05	0.01	0.04
Excavator- Trencher	D	0.50	8	2.00	250	2,000	270.01	357.66	60.26	7.10	56.35	0.27	0.36	0.06	0.01	0.06
Excavator- Earth Scraper	D	0.25	8	9.00	250	4,500	270.01	195.66	39.13	7.10	15.65	0.61	0.44	0.09	0.02	0.04
Excavator-Motor Grader	D	0.42	8	5.00	250	4,167	270.01	148.70	60.26	7.10	39.13	0.56	0.31	0.13	0.01	0.08
Excavator- Backhoe/loader	D	0.83	8	2.50	250	4,167	270.01	266.09	54.78	7.10	41.09	0.56	0.55	0.11	0.01	0.09
Excavator - loader	D	0.33	8	2.50	250	1,667	270.01	187.83	32.87	7.10	50.48	0.23	0.16	0.03	0.01	0.04
Vibratory Roller	D	0.67	8	10.00	250	13,333	270.01	121.31	11.74	7.10	30.52	1.80	0.81	0.08	0.05	0.20
Portable Compaction roller	D	0.67	8	10.00	250	13,333	270.01	121.31	39.13	7.10	15.65	1.80	0.81	0.26	0.05	0.10
Truck- Water	D	1.00	8	3.13	250	6,260	170.68	106.79	15.33	7.10	9.59	0.53	0.33	0.05	0.02	0.03
Forklift	D	1.00	4	2.50	250	2,500	270.01	237.14	61.44	7.10	62.61	0.34	0.30	0.08	0.01	0.08
Dump Truck	D	0.50	8	3.13	250	3,130	170.68	106.79	15.33	7.10	9.59	0.27	0.17	0.02	0.01	0.02
Service Truck- 1 ton	D	0.50	8	1.56	250	1,560	74.40	59.47	5.57	7.10	4.83	0.06	0.05	0.00	0.01	0.00
Truck- Fuel/Lube	D	1.00	2	3.13	250	1,565	170.68	106.79	15.33	7.10	9.59	0.13	0.08	0.01	0.01	0.01
Concrete Pumper Truck	D	0.25	8	3.13	250	1,565	170.68	106.79	15.33	7.10	9.59	0.13	0.08	0.01	0.01	0.01
Tractor Truck 5th Wheel	D	0.83	8	3.13	250	5,217	170.68	106.79	15.33	7.10	9.59	0.45	0.28	0.04	0.02	0.03
Trucks- Pickup 3/4 ton	G	4.00	8	0.78	250	6,240	62.81	677.30	46.28	0.27	1.56	0.20	2.11	0.14	0.00	0.00
Trucks- 3 ton	D	2.00	8	1.56	250	6,240	74.40	59.47	5.57	7.10	4.83	0.23	0.19	0.02	0.02	0.02
Diesel Powered Welder	D	0.83	4	1.27	250	1,058	313.05	195.66	46.96	7.10	39.13	0.17	0.10	0.02	0.00	0.02
Light Plants	D	1.33	8	1.27	250	3,387	313.05	195.66	46.96	7.10	39.13	0.53	0.33	0.08	0.01	0.07
Portable Compaction- Vibratory Plate	D	1.67	8	0.25	250	833	313.05	195.66	46.96	7.10	39.13	0.13	0.08	0.02	0.00	0.02
Portable Compaction- Vibratory Ram	D	1.67	8	0.25	250	833	313.05	195.66	46.96	7.10	39.13	0.13	0.08	0.02	0.00	0.02
Articulating Boom Platforms	D	3.08	8	0.25	250	1,542	313.05	195.66	46.96	7.10	39.13	0.24	0.15	0.04	0.01	0.03
Pumps	G	2.00	8	0.13	250	508	79.44	13813.38	748.58	0.27	2.35	0.02	3.51	0.19	0.00	0.00
Air Compressor 185 CFM	D	1.00	8	1.27	250	2,540	313.05	195.66	46.96	7.10	39.13	0.40	0.25	0.06	0.01	0.05
Air Compressor 750 CFM	D	1.36	8	1.27	250	3,464	313.05	195.66	46.96	7.10	39.13	0.54	0.34	0.08	0.01	0.07
Concrete Vibrators	D	3.17	8	0.25	250	1,583	313.05	195.66	46.96	7.10	39.13	0.25	0.15	0.04	0.01	0.03
Concrete Trowel Machine	D	0.33	0.8	1.27	250	85	313.05	195.66	46.96	7.10	39.13	0.01	0.01	0.00	0.00	0.00
Fusion Welder	D	0.55	8	1.27	250	1,385	313.05	195.66	46.96	7.10	39.13	0.22	0.14	0.03	0.00	0.03
Portable Power Generators	D	0.25	8	1.27	250	635	313.05	195.66	46.96	7.10	39.13	0.10	0.06	0.01	0.00	0.01
Total												14.04	14.11	2.26	0.40	1.51
Total for Gasoline-Powered Eqt												0.22	5.62	0.33	0.00	0.01
Total for Diesel-Powered Eqt												13.82	8.48	1.92	0.40	1.51

Daily Fugitive Dust Emissions (Month 7)
Turlock Irrigation District Walnut Energy Center

Equipment	Number of Units	Daily Process Rate Per Unit	Total Process Rate	Units	PM10 Emission Factor(1) (lbs/unit)	Control Factor(1) (%)	PM10 Emissions (lbs/day)
Bulldozer D6H	1	8.0	8.0	hours	0.4194	(a)	3.36
Bulldozer D4C	1	8.0	8.0	hours	0.4194	(a)	3.36
Excavator- Trencher Excavation	0						
Excavator- Earth Scraper Excavation	3	8.0	24.0	hours	0.4194	(a)	10.07
Excavator- Earth Scraper Unpaved Road Travel	3	14.5	43.6	vmt	1.1692	80%	9.99
Excavator-Motor Grader	1	24.0	24.0	vmt	1.5425	80%	7.26
Excavator- Backhoe Excavation	0						
Excavator - Loader Excavation	1	1,275.0	1,275.0	tons	0.0001	(a)	0.16
Excavator - Loader Unpaved Road Travel	1	26.3	26.3	vmt	0.6920	80%	3.57
Water Truck Unpaved Road Travel	1	20.0	20.0	vmt	0.9800	80%	3.85
Forklift Unpaved Road Travel	1	16.0	16.0	vmt	0.6243	80%	1.96
Dump Truck Unpaved Road Travel	2	13.6	27.3	vmt	1.0230	80%	5.47
Dump Truck Unloading	2	637.5	1,275.0	tons	0.0001	(a)	0.16
Service Truck Unpaved Road Travel	0						
Fuel/Lube Truck Unpaved Road Travel	1	3.4	3.4	vmt	0.7604	80%	0.51
Concrete Pumper Truck Unpaved Road Travel	0						
Tractor Truck 5th Wheel Unpaved Road Travel	0						
Pickup Truck Unpaved Road Travel	2	17.0	34.1	vmt	0.3857	80%	2.58
3 ton Truck Unpaved Road Travel	1	8.5	8.5	vmt	0.5173	80%	0.86
Windblown Dust (active construction area)	N/A	1,609,911.5	1,609,911.5	sq.ft.	1.684E-05	80%	5.32
Worker Gravel Road Travel	205	0.5	100.9	vmt	0.3112	80%	6.16
Delivery Truck Gravel Road Travel	10	0.5	4.9	vmt	0.8254	80%	0.80
Delivery Truck Unpaved Road Travel	10	0.2	1.7	vmt	1.0230	80%	0.34
Total =							65.76

Notes:

(a) Control included in the emission factor through the soil moisture content assumed in the emission factor equations.

Notes - Fugitive Dust Emission Calculations

(1)Paved Road Travel - Delivery Trucks and Workers - Source: AP-42, Section 13.2.1, 10/97

E = k(sL/2)^0.65*(W/3)^1.5

k = particle size constant =	0.016lb/VMT - PM10
sL = silt loading =	1.4g/m2 (SCAQMD CEQA Handbook Table A9-9-C-1, Construction Sites with Cleaning)
W = auto/pickup truck avg. vehicle weight =	2.4tons (CARB Area Source Manual, 9/97)
W = delivery truck avg. vehicle weight =	27.50tons (for heavy duty Diesel trucks)
E = auto/pick truck emission factor =	0.0091lb/VMT - PM10
E = delivery truck emission factor =	0.3522lb/VMT - PM10

(2)Wind erosion of active construction area - 'Source: "Improvement of Specific Emission Factors (BACM Project No. 1), Final Report", prepared for South Coast AQMD by Midwest Research Institute, March 1996

Level 2 Emission Factor =	0.011ton/acre-month
Construction Schedule =	5days/week (no longer factored into the equation)
=	0.7lbs/acre-day (based on 30 days/month)
=	1.684E-05lbs/scf-day

(3)Finish Grading - Source: AP-42, Table 11.9-2, 7/98

E = (0.60)(0.051)(S^2.0)

S = mean vehicle speed =	7.1mph (AP-42, Table 11.9-3, 7/98)
E = emission factor =	1.542546lb/VMT

(4)Bulldozer Operation and Scraper Excavation - Source: AP-42, Table 11.9.2, 1/95

E = (0.75)(s^1.5)/(M^1.4)

s = silt content =	8.5%applicant assumption
M = moisture content =	15.0%(SCAQMD CEQA Handbook Table A9-9-G-1, controlled)
E = emission factor =	0.4194lb/hr

(5)Scraper Travel

W = mean vehicle weight =		28.2tons empty (615E scraper, Caterpillar Performance Handbook, 10/98)
	=	48.6tons empty (615E scraper, Caterpillar Performance Handbook, 10/98)
	=	38.4tons mean weight
Daily Scraper Haul Tonnage =		5,100ton/day (estimated)
Scraper Load =		20.4ton (615E scraper, Caterpillar Performance Handbook, 10/98)
Daily Scraper Loads =		250.00loads/day
Daily Scraper Hauling Distance =		0.09miles/load (estimated)
Daily Scraper Travel =		43.56miles/day

(6)Material Unloading - Source: AP-42, p. 13.2.4-3, 1/95

E = (k)(0.0032)[(U/5)^1.3]/[(M/2)^1.4]

k = particle size constant =		0.35for PM10
U = average wind speed =		3.55m/sec (based on onsite wind data)
	=	7.94mph
M = moisture content =		15.0%(SCAQMD CEQA Handbook Table A9-9-G-1, Moist Soil)
E = emission factor =		0.00012lb/ton

(7)Loader Unpaved Road Travel - Source: AP-42, Section 13.2.2, 1/95

E = (k)[(s/12)^0.8][(W/3)^0.4]/[(M/0.2)^0.3]

k = particle size constant =	2.6
s = surface silt content =	8.5%applicant assumption
M = surface moisture content =	3.4%(AP-42, Table 13.2.4-1, 1/95, exposed ground)
W = avg. vehicle weight =	10.35tons (avg. of loaded and unloaded weights, 916 loader, Caterpillar Performance Handbook, 10/98)
E = emission factor =	0.69lb PM10/VMT
Soil Density =	1.05ton/yd3 (Caterpillar Performance Handbook, 10/89)
Loader Bucket Capacity =	1.75yd3 (916 loader, Caterpillar Performance

Handbook, 10/98)

= 1.84ton/load

Daily Soil Transfer Rate = 1,275ton/day (estimated)

Daily Loader Trips = 694loading trips/day

Slag Loading Travel Distance = 200ft/load (estimated)

Daily Loader Travel Distance = 138,776ft/day

= 26.3mi/day

(8)Backhoe Trenching - Source: AP-42, Table 11.9-2 (dragline operations), 1/95

E = (0.75)(0.0021)(d^0.7)/(M^0.3)

d = drop height = 3ft (estimated)

M = moisture content = 15.0%(SCAQMD CEQA Handbook Table A9-9-G-1, Moist Soil)

E = emission factor = 0.0015lb/ton

Backhoe Excavating Rate = 49.8yd3/hr (E70B backhoe, Caterpillar Performance Handbook, 10/89)

= 398yd3/day for 1 backhoe @ 8 hr/day

0.0751047

(9)Excavator Trenching - Source: AP-42, Table 11.9-2 (dragline operations), 1/95

E = (0.75)(0.0021)(d^0.7)/(M^0.3)

d = drop height = 3ft (estimated)

M = moisture content = 15.0%(SCAQMD CEQA Handbook Table A9-9-G-1, Moist Soil)

E = emission factor = 0.0015lb/yd3

Excavator Excavating Rate = 200.0yd3/hr (E110 excavator, Caterpillar Performance Handbook, 10/98)

= 1,600yd3/day for 1 excavator @ 8 hr/day

(10)Unpaved Road Travel - Source: AP-42, Section 13.2.2, 9/98.

E = (k)[(s/12)^0.8][(W/3)^0.4]/[(M/0.2)^0.3]

k = particle size constant = 2.6

s = silt fraction = 8.5%applicant assumption

6.5%Gravel Road - Unknown source

M = surface moisture content = 3.4%(AP-42, Table 13.2.4-1, 1/95, exposed ground)

W = water truck avg. veh. weight = 10.0tons empty (estimated)

= 39.4tons loaded (estimated with 8,000 gallon

		water capacity)
	=	24.7tons average
W = fuel truck avg. veh. weight =		8.0tons empty (estimated)
	=	18.2tons loaded (estimated with 3,000 gallons Diesel fuel capacity)
	=	13.1tons average
W = service truck avg. veh. weight =		5.0tons (estimated)
W = dump truck avg. veh. weight =		15.0tons (for heavy duty Diesel trucks)
	=	40.0tons (for heavy duty Diesel trucks)
	=	27.5tons (for heavy duty Diesel trucks)
W = concrete pumper truck avg. veh. wt. =		15.0tons (for heavy duty Diesel trucks)
	=	40.0tons (for heavy duty Diesel trucks)
	=	27.5tons (for heavy duty Diesel trucks)
W = forklift avg. veh. weight =		8.0tons empty (estimated)
W = auto/pickup avg. vehicle weight =		2.4tons (CARB Area Source Manual, 9/97)
W = delivery truck avg. veh. wt. =		27.5tons (for heavy duty Diesel trucks)
W = scraper avg. veh. wt. =		28.2tons empty (651E scraper, Caterpillar Performance Handbook, 10/89)
		48.6tons loaded (651E scraper, Caterpillar Performance Handbook, 10/89)
		38.4tons mean weight
		7.5Mean Vehicle Speed (MPH) – staff assumption
E = water truck emission factor =		0.98lb PM10/VMT
E = fuel truck emission factor =		0.76lb PM10/VMT
E = service truck emission factor =		0.52lb PM10/VMT
E = dump truck emission factor =		1.02lb PM10/VMT
E = concrete pumper truck emiss. factor =		1.02lb PM10/VMT
E = forklift emiss. factor =		0.62lb PM10/VMT
E = 5th wheel truck emiss. factor =		1.02lb PM10/VMT
E = auto/pickup emiss. factor =		0.39lb PM10/VMT
E = delivery truck emiss. factor =		1.02lb PM10/VMT
E = scraper emiss. factor =		1.17lb PM10/VMT
E = auto/pickup gravel road factor =		0.31lb PM10/VMT
E = delivery truck gravel road factor =		0.83lb PM10/VMT

(11)Unpaved Road Travel and Active Excavation Area Control - Source: Control of Open Fugitive Dust Sources, U.S EPA, 9/88

C = 100 - (0.8)(p)(d)(t)/(i)

	Average Annual
p = potential average hourly daytime evaporation rate =	0.464mm/hr (EPA document, Figure 3-2, average annual)
d = average hourly daytime traffic rate =	37.0vehicles/hr (estimated)

t = time between watering applications = 1.00hr/application (estimated)
i = application intensity = 0.7L/m2 (typical level in EPA document, page 3-23)
C = average watering control efficiency = 80.4%

BIOLOGICAL RESOURCES

Melinda Dorin

INTRODUCTION

This section provides staff's analysis of potential impacts to biological resources from Turlock Irrigation District's (TID) proposal to construct and operate the Walnut Energy Center (WEC). Impacts to federally- and state-listed species, species of special concern, wetlands, and other areas of critical biological concern will be analyzed. This document presents information regarding the affected biotic community and the potential environmental impacts associated with construction and operation of the WEC. Where necessary, it specifies mitigation plans and compensation measures to reduce potential impacts to less than significant levels. Compliance with applicable laws, ordinances, regulations, and standards (LORS) will be determined, and conditions of certification specified.

This analysis is based, in part, on information provided as of March 15, 2003 from TID's Application for Certification (AFC) (TID 2002a), the data adequacy supplement (TID 2002b), and responses to data requests (CH2MHill 2003a). Information was also gathered from conversations with the California Department of Fish and Game (CDFG), U.S. Army Corp of Engineers (ACOE) and the U.S. Fish and Wildlife Service (USFWS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

- **Clean Water Act of 1977**
  Title 33, United States Code, section 404 et seq., prohibit the discharge of dredged or fill material into the waters of the United States without a permit.
- **Endangered Species Act of 1973**
  Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.
- **Migratory Bird Treaty Act**
  Title 16, United States Code, sections 703-712, prohibit the take of migratory birds, including their eggs.
- **Bald and Golden Eagle Protection Act**
  Title 16, United States Code, section 668, protects bald and golden eagles from possession, selling, purchase, barter, offers to sell, purchase or barter, transport, export or import, at any time or in any manner, alive or dead, or any part, nest, or egg thereof of the foregoing eagles.

STATE

- **California Environmental Quality Act (CEQA)**

Public Resources Code section 21000 et seq. mandate protection of California's environment and natural resources to develop and maintain a high-quality environment now and in the future. Specific goals of CEQA are for California's public agencies to: 1) identify the significant environmental effects of their actions; and, either 2) avoid those significant environmental effects, where feasible; or 3) mitigate those significant environmental effects, where feasible.

- **Fish & Game Code Sections Protecting Biological Resources:**

  California Endangered Species Act of 1984: Fish and Game Code section 2050 et seq. protect California's rare, threatened, and endangered species.

  Nest or Eggs: Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.

  Birds of Prey or Eggs: Fish and Game Code section 3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

  Migratory Birds: Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird.

  Fully Protected Species: Fish and Game Code sections 3511, 4700, 5050, 5515 prohibit take of animals, or their habitat, that are classified as "Fully Protected" in California.

  Non-game Birds: Fish and Game Code sections 3800 et seq. protect all non-game birds by making it unlawful to take non-game birds or parts of a bird unless otherwise provided in this Code's section.

  Significant Natural Areas: Fish and Game Code section 1930 et seq. designate certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.

  Native Plant Protection Act of 1977: Fish and Game Code section 1900 et seq. designate state rare, threatened, and endangered plants.

  Streambed Alteration Agreement: Fish and Game Code section 1600, evaluates project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.

- **California Code of Regulations – Endangered Species**
  Title 14, sections 670.2 and 670.5 list animals of California designated as rare, threatened, or endangered.

- **Regional Water Quality Control Board Certification**

  Federal Clean Water Act section 401 requires certification from the state for discharge of dredge or fill material into Waters of the United States. The Regional Board provides certification after reviewing the ACOE permit.

LOCAL

- **City of Turlock General Plan Section 6 Open Space and Conservation Element - Open Space for the Preservation of Natural Resources**. The Turlock General Plan does not designate any lands specifically for the purpose of preserving natural resources, because no plant or animal species or areas of special concern have been located in the Planning Area. Pastures, vineyards, row crops, and orchards that are classified as Open Space for Resource Management, however, may serve as habitat or foraging areas for a variety of species.
- **Section 6.5 Open Space and Conservation Element - Vegetation and Wildlife** Lists the sensitive plant and animal species found in the regional planning area.
  - **6.5-a** Make efforts to enhance the diversity of Turlock's flora and fauna;
  - **6.5-b** Consider creation of suitable habitats that can support a variety of plant and animal species in designing new open spaces such as large community parks;
  - **6.5-c** Consider the requirement of biological assessments in conjunction with the preparation of new area-wide plans; and
  - **6.5-d** Consider establishment of special environmental review procedures, such as site reconnaissance and certification by a biologist, as part of the project development application process if new information to support existence of a Rare, Endangered, or Threatened species becomes available.
- **County of Stanislaus Conservation/Open Space Plan Goal One- Encourage the protection and preservation of natural and scenic areas throughout the County.**
  - **Policy One –** Maintain the natural environment in areas dedicated as parks and open space;
  - **Policy Two** – Assure compatibility between natural areas and development;
  - **Policy Three** – Areas of sensitive wildlife habitat and plant life (e.g., vernal pools, riparian habitats, flyways and other waterfowl habitats, etc.) including those habitats and plant species listed in the General Plan Support Document or by state or federal agencies shall be protected from development; and
  - **Policy Four –** Protect and enhance oak woodlands and other native hardwood habitat.

SETTING

REGIONAL

The proposed WEC project is located in the Central Valley approximately 50 miles west of the foothills that rise to the Sierra Nevada Mountains, and 25 miles east of the Coast Range. The northern portion of the Central Valley is known as the Sacramento Valley, and is drained by the Sacramento River. The San Joaquin Valley makes up the southern portion of the Central Valley and is drained by the San Joaquin River. The proposed WEC is located in the northern part of the San Joaquin Valley in Stanislaus County. The San Joaquin River flows northward, about seven miles west of the site, to join the Sacramento River before it enters the Sacramento-San Joaquin Delta.

The Sierra Nevada Mountains and the Coast Range directly influence the climate of the San Joaquin Valley. It rains an average of 12 inches a year in Stanislaus County. Temperatures range from an average low of 38°F in the winter, to an average high in the 90's during the summer months (Stanislaus County, 2003). Rich soils and available irrigation water have led to the reclamation of the historic grassland and marsh habitat for intensive agricultural production.

TID operates a series of irrigation canals and drains which deliver irrigation water to and from agricultural fields throughout the region. The canals in the area as well as the agricultural fields provide habitat for common species such as snowy egrets (*Egretta thula*), mallards (*Anas platyrhynchos*), and raptors such as red-tailed hawks *(Buteo jamiacensis*). Other animals found in the area include the California ground squirrel (*Spermophilus beecheyi*) and coyote (*Canis latrans*). The common species that are found in the region tend to do well in agricultural fields, irrigation canals and disturbed habitats.

Recovery plans and critical habitat

Recovery Plan for the Upland Species of the San Joaquin Valley

The *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) covers 34 species of plants and animals that inhabit the San Joaquin Valley. This Recovery Plan (Plan) takes an ecosystem approach to the recovery strategy. The San Joaquin kit fox (*Vulpes macrotis mutica*) is listed as the umbrella species for the plan as it occurs in nearly all of the natural communities covered. The giant kangaroo rat (*Dipodomys ingens*) is listed as a keystone species in its community. A keystone species provides important or essential components of the biological niche for other listed species. The species covered in the Plan that are within the region of the WEC are a rare plant, the Merced monardella (*Monardella leucocephala*) and the San Joaquin kit fox.

Vernal Pool Invertebrates and Plants, Proposed Critical Habitat

The USFWS has proposed critical habitat for eleven vernal pool plants and four vernal pool crustaceans in California and southern Oregon (USFWS 2002). Although there is proposed critical habitat in Eastern Stanislaus County, and Northern Merced County, none of the critical habitat units proposed are within the vicinity of the WEC. Landscape

that supports a vernal pool complex is typically grassland, with areas of topography or relief, and an impermeable clay or hard pan layer that form the pools. The pools may be fed or connected by low drainage pathways called swales. Because of the root restricting subsurface layer and sometime alkaline soils, trees are relatively rare in most vernal pool complexes. Upland areas associated with vernal pools are also an important source of nutrients to vernal pool organisms. Section 7 of the Endangered Species Act requires conferences on Federal actions that are likely to result in the destruction or adverse modification of proposed critical habitat.

Giant Garter Snake

The *Draft Recovery Plan for the Giant Garter Snake* (USFWS 1999) outlines the species' life history, habitat needs, distribution throughout the Central Valley of California, and the recovery strategy for the species. The ultimate goal of the Draft Recovery Plan is to de-list the giant garter snake from the Federal Endangered Species List when the Recovery Criteria are met. Loss of habitat remains the greatest threat, but road kills may also be a significant mortality factor in areas where roads are in close proximity to giant garter snake populations. Protection of existing habitat is one of the key components of the recovery strategy for this species. Because of the loss of natural habitat, giant garter snakes are often found in agricultural wetlands, drainage canals, managed marshes, and adjacent uplands in the Sacramento Valley. In the San Joaquin Valley they are known to inhabit the Mendota Wildlife Area, and the Grasslands of western Merced County (USFWS 1999).

LOCAL AND SITE VICINITY

The Foster Farms Foster Commodities – West Main facility and railroad tracks border the proposed WEC site on the north. The site is bordered on the south, east and west by agriculture. During 2002 surveys, the fields were planted with corn (TID, 2002a) and wheat over the 2002-2003 winter (Crowe 2002). Alfalfa is also grown in the area (TID 2002a, Figures 8.2-2A-H). The primary land uses in the site vicinity are agriculture and industry, with the main urban area of Turlock to the east of Highway 99, several miles from the proposed site. The primary water conveyance features in the project area include irrigation canals and drainages.

Along the existing dirt road that will be paved for site access are an earthen canal and a 0.5-acre area of riparian vegetation that includes Fremont cottonwood (*Populus fremontii*), black walnut (*Juglans hindsii*), mulberry (*Morus* sp.) and tree-of-heaven (*Ailanthus altissima*). The riparian patch receives water from the adjacent irrigation canal. Along the canal and the dirt road is a berm that contains small mammal burrows and could potentially be used by burrowing owls. Protocol level burrowing owl survey results have not been submitted. Other bird species that could potentially use the site for foraging habitat and the riparian area for nesting are Swainson's hawks and white-tailed kites. Although there are no California Natural Diversity Database (CNDDB) records for Swainson's hawks within a 0.5 mile of the site, it isn't an area that has been well documented and Swainson's hawk surveys for the project are not yet completed. There are previous records of nest sites along the San Joaquin River approximately six miles from the main project site (TID 2002a, Table 8.2-3). Swainson's hawk preferred foraging habitats include: alfalfa, fallow fields, low growing row or field crops, dry land

and irrigated pasture and grain crops. Swainson's hawks have been known to range out to 18.0 miles from the nest in search of prey (CDFG 1994).

Other sensitive species that could be found at the site and along the linear facilities are associated with vernal pools. It is unlikely that vernal pool plants or invertebrates will be found at the project site, or along the linear facilities, as the area is heavily disturbed from agricultural practices, but survey results have not been submitted (CH2MHill 2003b). No trees that will require removal or trimming are located within the project site, or within the construction corridors of the linear facilities.

Biological Resources Table 1 lists the wildlife and plant species of concern that were observed or have the potential to be present in the project area. Complete lists of species that were observed or could occur in the project vicinity are provided elsewhere in documents submitted by TID (TID 2002b, Table 8.2-7; TID 2002a, Appendix Table 8.2-3).

Power Plant Site and Laydown Area

The power plant site and laydown area are entirely within the agricultural field as described above. The WEC will occupy 18 acres of agricultural fields and the lay down area will occupy up to 51 acres during the construction phase. After construction is complete, the lay down area will be returned to agricultural production (TID, 2002a p. 8.2-12).

The WEC is being designed as a Zero Liquid Discharge Facility (ZLDF) for all cooling and process water. In order to capture storm water flow there would be an approximately 0.75-acre triangular shaped storm water detention pond, fenced on two sides, with the road and the cooling tower on the third side. Surface water is not expected to be in the pond for extended periods of time, such that wetland habitat will be created. Following a rain event, surface water may be present for up to two weeks, as it percolates into the ground. The storm water is not being discharged off-site (CH2MHill 2002b).

The proposed WEC will also have two 132-foot tall heat recovery steam generator (HRSG) stacks. TID is not proposing landscaping around the facilities.

Plant Access Road

The 1,900-foot long plant access road will consist of the conversion from an existing dirt road that runs along the railroad tracks to a paved road. The road is located close to the riparian area described above, and the potential burrowing owl locations. This road will be used during plant operations to access the WEC.

Another road will be constructed from the railroad tracks to the power plant site, in order to off-load equipment from the rail spur and transport it to the site. This short access road will be about 100 feet long, although the exact location has not been identified (CH2MHill 2003b, Response 34). It will be located in the agricultural field, and will cross the existing irrigation canal. The road will be graveled and then returned to its preexisting condition.

Biological Resources Table 1
Sensitive Species and Natural Communities
With the Potential to be Present in the WEC Project Area

Common Name	***Scientific Name***	**Status*** Fed/State/other
Plants		
Merced monardella	*Monardella leucocephala*	FSC/--/1B
Invertebrates		
California linderiella	*Linderiella occidentalis*	CSC/--/--
Vernal pool tadpole shrimp	*Lepidurus packardi*	FT/--/--
Conservancy fairy shrimp	*Branchinecta conservatio*	FE/--/--
Vernal pool fairy shrimp	*Branchinecta lynchi*	FE/--/--
Longhorn fairy shrimp	*Branchinecta longiantenna*	FE/--/--
Midvalley fairy shrimp	*Branchinecta mesovallensis*	FSC/--/--
Fishes		
Central Valley steelhead	*Oncorhynchus mykiss*	FT/--/--
Central Valley fall/late-fall chinook salmon	*Oncorhynchus tshawytscha*	FC/--/--
Sacramento splittail	*Pogonichthys macrolepidotus*	FT/--/--
Reptiles		
Giant garter snake	*Thamnophis gigas*	FT/CT/--
Western pond turtle	*Clemmys marmorata*	--/CSC/--
Birds		
Aleutian Canada goose	*Branta canadensis leucopareia*	FD/--/--
Swainson's hawk	*Buteo swainsoni*	--/CT/--
Ferruginous hawk	*Buteo regalis*	FSC/--/--
White-tailed kite	*Elanus leucurus*	FSC/FP/--
Western burrowing owl	*Athene cunicularia hypugaea*	FSC/CSC/--
Greater sandhill crane	*Grus canadensis tabida*	--/CT, FP/--
Snowy egret (rookery)	*Egretta thula*	--/FP/--
Great egret	*Ardea alba*	
Great blue heron	*Ardea herodias*	
Long-billed curlew	*Numenius americanus*	FSC/CT/--
White-faced ibis	*Plegadis chihi*	FSC/CSC/--
Mountain plover	*Charadrius montanus*	
Tricolored blackbird	*Agelaius tricolor*	--/CSC/--
California horned lark	*Eremophila alpestris actia*	--/CSC/--
Grasshopper sparrow	*Ammodramus savannarum*	FSC/--/--
Loggerhead shrike	*Lanius ludovicianus*	FSC/CSC/--
Mammals		
San Joaquin pocket mouse	*Perognathus inornatus inornatus*	FSC/CSC/--
San Joaquin kit fox	*Vulpes macrotis mutica*	FE/CT/--

*Federal: FE =Federally Endangered; FT= Federally Threatened; FSC= Federal "Species of Special Concern"; FP= Federally Proposed for listing;
State: CE= State listed as Endangered; CT= State listed as Threatened; FP=CDFG designated as "Fully Protected"; CSC=CDFG designated "Species of Special Concern" Other: 1B =List 1B is defined as plants that are rare, threatened or endangered in California and elsewhere. California Native Plant Society (CNPS) Inventory of Rare & Endangered Plants of California (2001).

Electrical Transmission Line

There will be two new electrical transmission lines, one a 69-kV and the other a 115-kV, constructed for the project. They will be constructed to the specifications listed in the Avian Power Line Interaction Committee Guidelines (APLIC 1996) (TID 2002a, p.8.2-21). The transmission lines are approximately 1,950 feet long for the 115-kV line and

670 feet long for the 69-kV line. The 69-kV lines tie into existing lines south of the site and west of the proposed storm water detention basin. The 115-kV lines tie into the existing Walnut Substation west of the site and across Washington Avenue. The transmission line towers will be located in the agricultural fields described above. The agricultural fields are not flooded in the winter; they are planted with a winter crop such as wheat. The fields do not provide preferred forage habitat for waterfowl and other bird species such as great blue herons.

Natural Gas Pipeline

The 3.6-mile natural gas pipeline parallels paved roads from the PG&E Line 215 connection on Bradbury Road, north on Commons Road and east along the railroad tracks to the site. The pipeline would be located on either side of Commons Road, and will result in a 50 to 75-foot wide construction corridor. In 2002, agricultural fields bordering Commons Road had crops such as corn and alfalfa, and disked fallow fields. Also along Commons Road are a dairy, its sludge ponds, and other facilities. A snowy egret and great blue heron were observed along the gas pipeline route (TID 2002b, Table 8.2-7). The proposed route along ruderal habitat and road shoulders does not provide significant foraging habitat for birds. There are potential nest trees for Swainson's hawks along the gas pipeline route.

The proposed pipeline construction method is to dry season open-cut trench except where horizontal directional drilling (HDD) technology may be required to cross a cement-lined canal called Lateral No. 5. The canal is usually dry in the winter months, but during the growing season has water in it for deliveries to agricultural users. The canal joins with the Harding Main Drain and empties into the San Joaquin River downstream about seven miles from the proposed gas pipeline crossing location. The canal has large gates downstream of the proposed gas pipeline crossing that prevent fish from entering it, although there is the potential for a fish to get over the gate. Where the main drain enters the San Joaquin River it forms a large dirt irrigation canal that is poor quality, but suitable, for fish and Salmonid habitat. A Nationwide Permit 12 may be required by the ACOE to cross the canal since it is considered "water of the U.S." and is jurisdictional. The CDFG also requires notification of crossings through the Streambed Alteration Agreement Permit process. Because the Canal is cement lined and not a natural waterway, CDFG will not require a Streambed Alteration Agreement.

HDD technology requires the use of drilling mud such as bentonite as a lubricant. A "frac-out" occurs when the bentonite returns to the surface through a fissure or crack. If the canal contains surface water during the HDD then bentonite could migrate downstream and smother benthic invertebrates, fish eggs, young fish and aquatic plants.

Water Supply and Pipeline

The WEC will have two water supply pipelines, one for potable water and the other for reclaimed water to be used for cooling. The City of Turlock is constructing a wastewater treatment facility that should be online by May 2006. Until reclaimed water becomes available, the applicant has proposed the use of potable water from existing city wells for construction and operation. The WEC will use reclaimed water for cooling when the tertiary treatment plant is completed, although the city well water may still be used as the potable water supply, and as a back-up source for cooling water (see **Water**

Resources section). Since the majority of well water will be used temporarily and tertiary treated wastewater will be used when the treatment plant is online, there are no fish species that will be affected by the use of the proposed water supply.

The potable water pipeline route follows Rubble Road east along some commercial properties until it gets to South Tegner Road where it will tie into the existing City of Turlock's main water line (TID 2002a, p. 7-2). The reclaimed water pipeline will parallel the potable water pipeline route but instead of ending at South Tegner Road, will head south and then east through some fields to the wastewater treatment plant. The fields were fallow in 2002.

There is the potential for some vernal pools or a nesting Swainson's hawk to be located along the water pipeline routes, but the construction corridors are either along road shoulders, or through fields that have been intensely farmed. Species specific survey results along the gas pipeline have not been submitted yet, but surveys are being conducted (Crowe, 2003). A loggerhead shrike was observed along the water pipeline route during Fall 2002 reconnaissance surveys (TID 2002b, Table 8.2-7).

ANALYSIS AND IDENTIFICATION OF POTENTIAL ADVERSE IMPACTS

PROJECT SPECIFIC DIRECT AND INDIRECT IMPACTS

Potential impacts to biological resources from the construction, operation, and maintenance activities of the proposed project include:

- permanent and temporary loss of agricultural habitat from the project footprint, lay down area and linear facilities; and
- potential mortality and/or injury to wildlife during construction, and from the project's transmission lines and emission stacks.

Permanent and Temporary Loss of Habitat

The proposed project will result in temporary and permanent habitat loss. Agricultural land provides foraging and nesting habitat for special-status species such as Swainson's hawks and burrowing owls. A summary of project-related permanent and temporary acreage impacts is provided in **Biological Resources Table 2**, below.

Loss of habitat is the primary cause of population declines of special-status species in the San Joaquin Valley (USFWS 1998, p. ix). It is also cited as a reason for decline in Swainson's hawk (CDFG 1994) and burrowing owl (CDFG 1995) populations. An estimate of 18.0 acres of permanent agricultural habitat will be lost from the project footprint and linear facilities. Survey results for burrowing owls and Swainson's hawks have not been submitted by TID, although they are being completed spring 2003 (CH2MHill 2003b, Data Responses 25, 26 and 27). Staff will evaluate the data responses and provide an assessment of the impact to special status species in the Final Staff Assessment (FSA).

Biological Resources Table 2
Permanent and Temporary Impacts (Acres)

PROJECT COMPONENT	Permanent	Temporary
Power plant site	16 acres	N/A
Access roads	1.9 acres	N/A
Construction Lay down	N/A	51 acres
Natural Gas Pipeline	N/A	33 acres
Potable water supply pipeline*	N/A	10.9 acres
Recycled water supply pipeline*	N/A	8.5 acres
Transmission Lines	0.1 acres	Not estimated
Total	**18.0 acres**	**≥103.4 acres**

Source: TID 2002a
* For 0.9 mile the Potable and Recycled water pipelines will be in the same trench

No wetlands or vernal pool invertebrate habitat have been identified during reconnaissance level surveys. Additional spring surveys are being conducted (CH2MHill 2003b, Data Responses 24 and 28), and results will be submitted when they are complete. Staff will evaluate the data responses and provide an assessment of the impact to wetlands and vernal pool invertebrate habitat in the FSA.

San Joaquin kit fox are present in the region of the proposed WEC, but are unlikely to be present in the immediate area (USFWS 2003). Giant garter snakes are also not known to occur within the project vicinity (USFWS 1999 and Zerrenner 2003). There will be no habitat loss impacts to these two species at the proposed WEC.

The natural gas and water supply pipelines will be sited within road shoulders and ruderal habitat. The lay down area will be returned to agriculture use when construction of the WEC is complete. Once construction is complete there will be no additional habitat disturbance or loss. Therefore, no significant impacts to the species listed in **Biological Resources Table 1** from temporary habitat loss are expected.

Species Mortality and Injury

Sensitive Plants

No sensitive plants were observed during reconnaissance surveys of the project site and linear facilities. Follow-up spring/summer plant surveys are being conducted this year. The only plant listed as occuring in the area, Merced monardella, is found in valley and foothill grasslands with sandy soils. It was last seen in 1941, and may have been extirpated by agriculture (CNPS 2001). Suitable habitat does not exist at the project site or along the linear facilities, so staff does not anticipate that construction of the WEC will have significant impacts on sensitive plants.

Sensitive Wildlife

Invertebrates

Individuals of listed crustaceans and their cysts identified in **Biological Resources Table 1** may be directly injured or killed by activities leading to the destruction of the pools in which they exist, or indirectly injured by changes in hydrology, building of roads,

use of pesticides/herbicides and introduced predators (USFWS 1996). Impacts to individuals or their cysts requires an USFWS incidental take permit under Section 7 of the Federal Endangered Species Act. Spring surveys to assess whether vernal pool invertebrate habitat exists at the project site, or along the linear facilities are being conducted (CH2MHill 2002b, Data Response 28). Staff will evaluate the data response and provide an assessment of the potential impact to special status invertebrate species in the FSA.

Fish

The sensitive fish species identified in **Biological Resources Table 1** could be impacted during construction of the gas pipeline if there was a frac-out and bentonite migrated downstream. A contingency plan to respond and contain a frac-out will reduce impacts to a less than significant level.

There will be no impacts to fish species from water use since the WEC will use reclaimed water for cooling, the potable water source is from existing City of Turlock wells and the WEC is a ZLDF. Storm water will be not be discharged and the storm water detention pond will not provide suitable habitat for fisheries. Staff has not identified any impacts to sensitive fish species from the operation of the WEC.

Reptiles

Giant garter snakes will not be impacted by project activities, since they are not known to inhabit the project site or occur along the linear facilities (USFWS 2003).

Western pond turtles may be found in the irrigation canals that border the site and are known to occur in the San Joaquin River. The irrigation canal on the north side of the site will be crossed by the proposed road from the railroad off-loading area to the site. Construction activities could harm western pond turtles if individuals were in the irrigation canals. It is unlikely that pond turtles inhabit Lateral No. 5, since it is cement lined, and there are no basking logs or snags to provide habitat. Western pond turtles in the San Joaquin River or in the Harding Main Drain could be adversely impacted if there was a frac-out during the HDD under Lateral No. 5. A frac-out that is not contained could change the water quality in turtle habitat and turtles may be injured by the clean up crew. Surveys for western pond turtles will be included as part of the frac-out contingency plan, and completed prior to clean up, if the clean up is in turtle habitat. In order to minimize impacts, a frac-out emergency plan will be in place, and drilling mud will be contained before moving downstream to the San Joaquin River. A draft frac-out emergency plan has been submitted (CH2MHill 2003b).

Birds

Burrowing owls could be impacted by construction activities if they are present in the berms near the railroad tracks and the project site. Harassment to either individuals or pairs will occur if they are within 250 feet of construction activities during nesting season or 160 feet during non-nesting season. Nesting season is defined as February 1 to August 31 each year (CBOC 1993; CDFG 1995). When survey results are submitted staff can assess the potential impacts to burrowing owl individuals or pairs.

Swainson's hawks are not known to have nested within a 0.5 mile of the project site or related facilities, but spring nesting survey results have not been submitted (Data Response 25, 2003a). Construction activities near a nest that causes nest abandonment or unsuccessful fledging of chicks would result in a significant impact. If there are nesting Swainson's hawks within a 0.5-mile of the project site or linear facilities then a CDFG 2081 Incidental Take Permit will be required for construction activity during the nesting season. Potential impacts to nesting Swainson's hawks from construction of the water and gas pipelines could be avoided if construction was conducted after the nesting season. Staff will evaluate the data response and provide an assessment of the impact to Swainson's hawks in the FSA.

Other birds identified in **Biological Resources Table 1** may be found utilizing the agricultural field or the irrigation ditches for foraging or nesting habitat. If nests of birds protected by the Migratory Bird Treaty Act or other CDFG codes (see **LORS** section) were taken as a result of project activities, then it would be considered a significant impact. Activities that result in take or needless destruction of nests or eggs of any protected bird is considered a significant impact. The riparian area described above along the access road will not be affected by project activities so it is unlikely that impacts to birds using that area will occur.

Avian Electrocution

The WEC transmission lines, if not constructed according to current guidelines, have the potential to electrocute birds. Installation of transmission lines and construction of the transmission line towers according to the guidelines suggested by the Avian Powerline Interaction Committee (APLIC 1996) will greatly reduce the likelihood that birds will be electrocuted.

Avian Collision

Bird collisions with electric transmission lines, transmission line ground wires, and exhaust stacks can result in significant bird losses when these structures are located in areas where suitable habitat attracts bird populations. Most bird collisions occur in inclement weather during migration, or movement between feeding and resting grounds (APLIC 1994). The storm water pond, as designed, will be between the two proposed transmission lines. After a rain event the storm water pond may provide some resting and foraging habitat for waterfowl and other species such as egrets and great blue herons. While it is unlikely that there will be a significant impact from avian collisions with the power lines, information on what species are using the pond, and how long water remains after a rain event will be helpful in assessing bird use of the area and whether birds are colliding with the transmission lines.

The proposed stack height of 132 feet (AFC, p. 8.1-46) is of similar height as the industrial facilities to the north, which are approximately 115 feet tall (AFC Figure 2.2-2b). Towers less than 200 feet tall do not usually have bird kills associated with them, as they are not normally lighted to meet Federal Aviation Administration (FAA) requirements. (Towerkill.com 2003).

TID proposes to light the facilities for safety, security and operation. Lights will be hooded (TID 2002a, p. 8.11-12). The FAA would not require lighting for this project, as

the stacks are less than 199 feet tall. Flashing and solid red lights have been shown to cause significant increases in bird strikes with towers and if feasible, should not be used. The USFWS recommends that unless required by the FAA for towers over 199 feet tall, only white (preferred) or red strobe lights should be used (USFWS 2000).

Power Plant Emissions

Air emissions for the HRSG stacks and cooling tower will not have a significant impact on surrounding vegetation and soils. Pollutants emitted from the stacks include carbon monoxide (CO), oxides of nitrogen and sulfur (NO_x and SO_2), unburned hydrocarbons (VOC), and inhalable particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}). The turbines will be equipped with dry low-NO_x combustors that minimize the formation of NO_x and CO. To further reduce NO_x and CO emissions, selective catalytic reduction (SCR) and oxidation catalyst control systems will be utilized (TID 2002a, p 8.1-35).

The maximum one-hour CO emissions of 187 micrograms per cubic meter ($\mu g/m^3$) predicted from the stack, combined with the maximum one-hour CO background air concentration of 5,730 $\mu g/m^3$, results in a total predicted one-hour concentration of 5,917 $\mu g/m^3$. This is below ambient air quality standards (23,000 $\mu g/m^3$) and below concentrations known to result in growth retardation in plants (115,000 $\mu g/m^3$) and below the concentration found to result in slight reduction of nitrogen fixation (113,000 $\mu g/m^3$) (TID 2002a, p. 8.1-53).

The maximum annual SO_2 concentrations of 5.7 $\mu g/m^3$ predicted from the stacks combined with the SO_2 background air concentration of 23.6 $\mu g/m^3$, is lower than the threshold for chronic plant injury estimated at 130 $\mu g/m^3$ (TID 2002a, p. 8.1-53).

The maximum predicted annual average of NO_x emissions for this project (0.60 $\mu g/m^3$) is lower than the 219.0 $\mu g/m^3$ threshold limits that can cause decreases in dry weight and leaf area on plants (TID 2002a, p. 8.1-53). The maximum annual predicted concentration for PM_{10} from the WEC is 0.3 $\mu g/m^3$. Combined with the maximum ambient background concentration of 33 $\mu g/m^3$ measured in the project area, this will result in a total impact of 33.3 $\mu g/m^3$ (TID 2002a, page 8.1-53).

There are no nitrogen sensitive habitats within the vicinity of the proposed WEC such as serpentine soils, or scrub habitat, which could be impacted by power plant emissions. Emissions from the HRSG stacks will not have a significant affect on surrounding vegetation and soils. Furthermore, there are no Class 1 Wilderness Areas within the project vicinity that could be affected by emissions from the WEC.

CUMULATIVE IMPACTS

Cumulative impacts are those that result from the incremental impacts of an action added to other past, present, and reasonably foreseeable future actions, regardless of who is responsible for such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The area surrounding the WEC is primarily used for farming, dairies and industry. As agricultural and open space areas in the San Joaquin Valley are developed for urban, industrial and municipal uses there is increasing pressure put on species that use those habitats for nesting and forage. Habitat loss is cited as one of the main concerns with the species that reside within the site vicinity. No sensitive species were observed during reconnaissance level surveys, so no cumulative impacts from the project to habitat loss are expected. When spring survey results are submitted, staff will assess any potential cumulative impacts.

Since the proposed WEC will be using reclaimed water when the tertiary treatment plant is completed, and the potable water supply is from existing wells, there will not be any cumulative impacts to aquatic biological resources from water use.

MITIGATION

TID has proposed the following general project construction measures to lessen impacts to biological resources (TID 2002a, pp. 8.2-19, -20). Staff agrees with the measures and has incorporated them into staff's proposed **Biological Resources Conditions of Certification**.

GENERAL PROTECTION MEASURES

TID Proposed Measures

- Provide mitigation construction monitoring by a qualified Designated Biologist and onsite Biological Monitors during construction activities near sensitive habitats (**BIO-1, BIO-2** and **BIO-3**);
- Provide worker environmental awareness training for all construction personnel that identifies the sensitive biological resources and measures required to minimize project impacts during construction and operation (**BIO-4**);
- Prepare a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) that outlines how the applicant will implement the mitigation measures developed in order to maintain any action authorized, funded, or carried out by state or federal lead agencies (**BIO-5**);
- Avoid sensitive habitats and species during construction by developing construction exclusion zones and fencing around sensitive areas (**BIO-2** and **BIO-12**);
- Conduct additional preconstruction surveys for sensitive species in potential impact areas during the spring before construction begins, particularly within 500 feet of potential burrowing owl burrows or within 0.5 mile of potential Swainson's hawk nests (**BIO-12**);
- Prepare construction monitoring and compliance reports that analyze the effectiveness of the mitigation measures (**BIO-2**); and
- Restore all areas not required for permanent easements and development to preconstruction conditions, including topography, hydrology, topsoil, and if appropriate, revegetation that focuses on erosion control (**BIO-5** and **BIO-12**).

Staff Proposed Measures

Staff recommends the following additional general measures to reduce potential impacts:

- Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity (**BIO-2**);
- Make certain that all food-related trash is disposed of in closed containers and removed at least once a week. Feeding of wildlife shall be prohibited (**BIO-12**);
- Prohibit pets and non-security related firearms from being brought to the site (**BIO-12**); and

TID and staff proposed mitigation measures will help reduce potential impacts during construction activities.

MITIGATION TO REDUCE INDIVIDUAL INJURY OR MORTALITY

TID proposes the following mitigation measures if sensitive species were found on the project site, or along the linear facilities during preconstruction surveys and construction monitoring activities (TID 2002a, pp. 8.2-20 –22). Staff has incorporated the mitigation measures into the **Biological Resources Conditions of Certification**.

Fish

TID Proposed Measures

TID proposes the following mitigation measures to reduce impacts to fisheries. Staff agrees with the measures and has incorporated them into **Biological Resources Conditions of Certification.**

Avoid Lateral No. 5 and downstream reaches of Harding Drain habitats with modifications to gas pipeline design that include use of a trenchless construction method (HDD or jack-and-bore) or construction during the dry season (**BIO-12**);
If deemed necessary by the CDFG or Regional Water Quality Control Board, obtain a Streambed Alteration Agreement and water quality certification for the HDD activities (if that construction method is used) that includes protection measures for biological resources downstream (**BIO-8** and **BIO-9**);
Develop a contingency plan for response to a potential frac-out into waterways during drilling activities (**BIO-5**); and
Implement erosion control measures in the temporary impact areas, especially near drainages and waterways and revegetate temporary disturbance areas with like species (i.e. grassland species in grassland areas) (**BIO-5** and **BIO-12**).

Staff Proposed measures

Staff does not recommend additional mitigation measures to reduce impacts to fisheries. With implementation of the mitigation measures, potential impacts to fisheries will be reduced to less than significant levels.

Reptiles

TID Proposed Measures

TID proposes the following mitigation measures to reduce impacts to the western pond turtle. Staff agrees with the measures and has incorporated them into the **Biological Resources Conditions of Certification**.

1. Complete preconstruction surveys in project construction zones to find and relocate individual animals prior to ground disturbance activities (**BIO-2**);
2. Set up construction zone limits in the vicinity of any potential western pond turtle habitat using silt fencing and signage indicating the area is protected and not accessible to construction equipment and materials (**BIO-12**);
3. Relocate western pond turtles encountered in the construction zone to safe areas outside the construction zone limits (**BIO-2**); and
4. Provide a qualified Biological Monitor during construction in potential western pond turtle habitat (**BIO-2**).

Staff Proposed Measures

Staff does not recommend additional mitigation measures to reduce impacts to western pond turtles. With implementation of these mitigation measures, impacts will be reduced to less than significant levels.

Birds

TID Proposed Measures

TID proposes the following mitigation measures to reduce impacts. Staff agrees with the measures and has incorporated them into **Biological Resources Conditions of Certification**.

1. Construct raptor friendly 115-kV and 69-kV electric transmission lines with conductor wire spacing greater than the wingspans of large birds (42 inches on the vertical and 60 inches on the diagonal to prevent electrocutions (**BIO-11**); and
2. Provide safety lighting that points downward on the HRSG stacks to reduce avian collisions (**BIO-11**).

Staff Proposed Measures

Staff recommends that the following additional mitigation measures be implemented.

TID shall construct the transmission lines to meet the recommended measures in the APLIC document *Mitigating Bird Collisions With Power Lines: The State of the Art in 1994* (APLIC 1994) (**BIO-11**); and

Monitor bird use of the storm water detention basin and the transmission line crossing to identify which birds are using the area for foraging or resting habitat. A plan will be developed to monitor the site after a rain event when standing water in the storm water detention basin may attract birds. The plan will be included in the BRMIMP (**BIO-5**).

Implementation of TID's and staff's proposed mitigation measures will reduce the identified impacts to less than significant levels.

FACILITY CLOSURE

Sometime in the future, the WEC will experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an "on-site contingency plan" will be developed by the project owner, and approved by the Energy Commission CPM. Facility Closure mitigation measures will also be included in the BRMIMP (**BIO-6**).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

There are several outstanding issues that need to be resolved prior to the FSA. The applicant has agreed to provide the results of the following biological surveys in spring of 2003:

- Survey results for burrowing owls;
- Survey results for Swainson's hawks;
- Survey results for wetlands; and
- Survey results for vernal pool invertebrate species.

After these survey results are submitted staff will assess whether any additional mitigation measures are needed. Survey results could also potentially affect which permits may be required from the CDFG, the USFWS and the ACOE and change the proposed **Biological Resources Conditions of Certification**.

COMPLIANCE WITH LORS

TID would be required to enter into a Federal Endangered Species Act Section 7 or Section 10 consultation with the USFWS if vernal pool invertebrate species are present on the project site or along the linear facilities (**BIO-13**). In addition, CDFG has recommended that TID file a Streambed Alteration Agreement Application. The notification is for the gas pipeline crossing of the Lateral No. 5 canal (**BIO-8**). TID will also be required to receive a CDFG Incidental Take Permit, if Swainson's hawks are present during spring surveys. Depending on spring survey results, **BIO-7** may not be required.

TID may also be required by the ACOE to file for a Nationwide Permit to cross the Lateral No. 5 canal. If TID applies for a Nationwide Permit then the Regional Water Quality Control Board also requires water quality certification. Staff has recommended that the applicant apply for these two permits (**BIO-9** and **BIO-10**). If the ACOE does not require a permit, then staff's proposed **Biological Resources Conditions of Certification** may change in the FSA.

When survey results are submitted, staff will assess LORS requirements and TID compliance.

RECOMMENDATIONS

As discussed above, staff expects to incorporate all outstanding information into the FSA. The information that the applicant is preparing, when provided, should allow staff to make a final conclusion regarding the project's potential impacts and recommend suitable mitigation in the FSA. Depending on the results of the surveys and analysis the following Conditions of Certification may be modified.

CONDITIONS OF CERTIFICATION

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall submit the resume, including contact information, of the proposed Designated Biologist and Biological Monitors to the CPM for approval.

Verification: The project owner shall submit the specified information at least 60 days prior to the start of any site (or related facilities) mobilization. Site and related facility activities shall not commence until an approved Designated Biologist and Biological Monitors are available to be on site.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
3. At least one year of field experience with biological resources found in or near the project area; and

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist and Biological Monitors shall perform the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources Conditions of Certification;

2. Be available to supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special status species or their habitat;
3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
4. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (parking lots) for animals in harms way;
5. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification; and
6. Respond directly to inquiries of the CPM regarding biological resource issues.

Verification: The project owner shall ensure that the Designated Biologist maintains written records of the tasks described above, and summaries of these records shall be submitted in the Monthly Compliance Reports.
During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

DESIGNATED BIOLOGIST AUTHORITY

BIO-3 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist to ensure conformance with the biological resources Conditions of Certification.

If required by the Designated Biologist, the project owner's Construction/ Operation Manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there shall be adverse impact to biological resources if the activities continued;
2. Inform the project owner and the Construction/Operation Manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the halt.

Verification: The project owner shall ensure that the Designated Biologist notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The

project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-4 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program (WEAP) in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation and closure are informed about sensitive biological resources associated with the project.

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. Present the reasons for protecting these resources;
4. Present the meaning of various temporary and permanent habitat protection measures;
5. Identify whom to contact if there are further comments and questions about the material discussed in the program; and
6. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: At least 60 days prior to the start of any site (or related facilities) mobilization, the project owner shall provide to the CPM two (2) copies of the WEAP and all supporting written materials prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

The signed training acknowledgement forms shall be kept on file by the project owner for a period of at least six months after the start of commercial operation.

During project operation, signed statements for active project operational personnel shall be kept on file for six months following the termination of an individual's employment.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP)

BIO-5 The project owner shall submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFG and USFWS (for review and comment) and shall implement the measures identified in the approved BRMIMP.

The final BRMIMP shall identify;

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
2. All biological resources Conditions of Certification identified in the Commission's Final Decision;
3. All biological resource mitigation, monitoring and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion;
4. All biological resources mitigation, monitoring and compliance measures required in other state agency terms and conditions, such as those provided in the CDFG Incidental Take Permit and Streambed Alteration Agreement and Regional Water Quality Control Board permits;
5. All biological resources mitigation, monitoring and compliance measures required in local agency permits, such as site grading and landscaping requirements;
6. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure;
7. All required mitigation measures for each sensitive biological resource;
8. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
9. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;
10. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities - one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen;
11. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
12. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

13. All performance standards and remedial measures to be implemented if performance standards are not met;
14. A discussion of biological resources related facility closure measures;
15. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval;
16. A copy of all biological resources permits obtained;
17. A contingency plan for response to a potential frac-out into waterways during drilling activities;
18. A copy of the restoration and revegetation plan; and
19. A plan for monitoring the storm water detention basin for bird use and the transmission lines for bird kills.

Verification: The project owner shall provide the specified document at least 60 days prior to start of any site (or related facilities) mobilization.
The CPM, in consultation with the CDFG, the USFWS and any other appropriate agencies, will determine the BRMIMP's acceptability within 45 days of receipt.

The project owner shall notify the CPM no less than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval.

Any changes to the approved BRMIMP must also be approved by the CPM in consultation with CDFG, the USFWS and appropriate agencies to ensure no conflicts exist.

Within thirty (30) days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

CLOSURE PLAN MEASURES

BIO-6 The project owner shall incorporate into the permanent or unexpected permanent closure plan, and the BRMIMP, measures that address the local biological resources.
The planned permanent or unexpected permanent closure plan shall address the following biological resources related mitigation measures:

1. Removal of transmission conductors when they are no longer used and useful;
2. Removal of all power plant site facilities and related facilities;
3. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species; and
4. Revegetation of the plant site and other disturbed areas utilizing appropriate seed mixture, if it shall not returned to agricultural production.

Verification: At least 12 months prior to commencement of closure activities, the project owner shall address all biological resources related issues associated with

facility closure, which is incorporated into the BRMIMP, in a Biological Resources Element. The Biological Resources Element shall be incorporated into the Facility Closure Plan and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

INCIDENTAL TAKE PERMIT

BIO-7 The project owner shall acquire an Incidental Take Permit from the California Department of Fish and Game (CDFG) (per Section 2081(b) of the Fish and Game Code; California Endangered Species Act) and incorporate the terms and conditions into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the final CDFG Incidental Take Permit.

STREAMBED ALTERATION AGREEMENT

BIO-8 The project owner shall acquire a Streambed Alteration Agreement from the CDFG (per Section 1600 of the Fish and Game Code), and incorporate the biological resource related terms and conditions into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the final CDFG Streambed Alteration Agreement.

REGIONAL WATER QUALITY CONTROL BOARD CERTIFICATION

BIO-9 The project owner shall acquire the Regional Water Quality Control Board Section 401 state Clean Water Act certification, and incorporate the biological resource related terms and conditions into the project's BRMIMP.

At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall provide the CPM with a copy of the final Regional Water Quality Control Board's certification.

U. S. ARMY CORPS OF ENGINEERS SECTION 404 PERMIT

BIO-10 The project owner shall provide a final copy of the U.S. Army Corps of Engineers Section 404 of the federal Clean Water Act permit. The biological resources related terms and conditions contained in the permit shall be incorporated into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the U.S. Army Corps of Engineers permit.

PREVENTATIVE DESIGN MITIGATION FEATURES

BIO-11 The project owner shall modify the project design to incorporate all feasible measures that avoid or minimize impacts to the local biological resources.

Protocol:

1. Design transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources;
2. Design and construct transmission lines and all electrical components to reduce the likelihood of electrocutions of large birds (APLIC 1994 and 1996); and
3. Provide safety lighting that points downward on the HRSG stacks to reduce avian collisions.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP.

CONSTRUCTION MITIGATION MANAGEMENT TO AVOID HARASSMENT OR HARM

BIO-12 The project owner shall manage their construction site, and related facilities, in a manner to avoid or minimizes impacts to the local biological resources. The project owner shall:

1. Temporarily fence and provide wildlife escape ramps for construction areas that contain steep walled holes or trenches if outside of an approved, permanent exclusionary fence;
2. Make certain all food-related trash is disposed of in closed containers and removed at least once a week. Feeding of wildlife shall be prohibited;
3. Prohibit non-security related firearms or weapons from being brought to the site;
4. Prohibit pets from being brought to the site;
5. Report all inadvertent deaths of sensitive species to the appropriate project representative. Injured animals shall be reported to CDFG and the project owner shall follow instructions that are provided by CDFG;
6. Conduct additional preconstruction surveys for sensitive species in potential impact areas during the spring before construction begins; and
7. Restore all areas not required for permanent easements and development to preconstruction conditions, including topography, hydrology, topsoil, and if appropriate, revegetation that focuses on erosion control;
8. Use a trenchless construction method (HDD or jack-and-bore) or cross Lateral No. 5 during the dry season;

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP.

FEDERAL BIOLOGICAL OPINION

BIO-13 The project owner shall provide final copies of the Biological Opinion per Section 7 of the federal Endangered Species Act obtained from the U. S. Fish and Wildlife Service. The terms and conditions contained in the Biological Opinion shall be incorporated into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the U. S. Fish and Wildlife Service's Biological Opinion.

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CULTURAL RESOURCES

Gary Reinoehl

INTRODUCTION

This cultural resources analysis identifies potential impacts of the proposed Walnut Energy Center on cultural resources, as defined under state and federal law. The primary concern in cultural resources analysis for this project is to ensure that all potential impacts are identified and that conditions are set forth that ensure that impacts are mitigated below a level of significance under the California Environmental Quality Act (CEQA).

Staff provides a cultural overview of the project, as well as analyses of potential impacts from the project using criteria from CEQA. If cultural resources are identified, staff determines whether there may be project related impacts to identified resources and if the resource is eligible for the California Register of Historic Resources (CRHR). If the resources meet the eligibility requirements for the CRHR, staff recommends mitigation that attempts to ensure that no significant impacts will occur and that will reduce impacts to the cultural resource to a less than significant level, if possible.

There is always a potential that a project may impact a previously unidentified resource or may impact an identified historical resource in an unanticipated manner. Staff, therefore, recommends procedures in the conditions of certification that mitigate these potential impacts.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following laws, ordinances, regulations, standards, and policies (LORS) apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these LORS.

FEDERAL

- Code of Federal Regulations, 36 CFR Part 61. 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 mitigation of impacts to cultural resources on public lands in California.
- Code of Federal Regulations, 36 CFR Part 800 et seq., the implementing regulations of Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470 requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. The regulations implementing this act, which were revised in 1997, set forth

procedures to be followed for determining eligibility of cultural resources, determining the effect of the undertaking on the historic properties, and how the effect will be taken into account. The eligibility criteria for the National Register of Historic Places (NRHP) and the process described in these regulations are used by federal agencies. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California Register of Historical Resources.

STATE

- California Code of Regulations, Title 14, section 4852 defines the term "cultural resource" to include buildings, sites, structures, objects, and historic districts.
- Public Resources Code, Section 5000 establishes the California Register of Historical Resources (CRHR), establishes criteria for eligibility to the CRHR, and defines eligible resources. It identifies any unauthorized removal or destruction of historic resources on sites located on public land as a misdemeanor. It also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and establishes the penalty for possession of such artifacts with intent to sell or vandalize them as a felony. This section defines procedures for the notification of discovery of Native American artifacts or remains, and states that it is the policy of the State that Native American remains and associated grave artifacts shall be repatriated.
- The California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.; Title 14, California Code of Regulations, section 15000 et seq.) requires analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code section 21083.2 states that the lead agency determines 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, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation; limits the Applicant’s cost of mitigation; sets time frames for excavation; defines “unique and non-unique archaeological resources;” and provides for mitigation of unexpected resources. [The California Energy Commission process is a CEQA equivalent process.]
- Public Resources Code section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource. The section further defines a “historic resource” and describes what constitutes a “significant” historic resource.
- CEQA Guidelines, Title 14, California Code of Regulations, section 15126.4(b), prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project’s impact on a historical resource; discusses documentation as a mitigation measure; and discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery

through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.

- CEQA Guidelines, section 15064.5 defines the term “historical resources,” explains when a project may have a significant effect on historic resources, describes CEQA’s applicability to archaeological sites, and specifies the relationship between “historical resources” and “unique archaeological resources.”
- Penal Code, section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- California Health and Safety Code, section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.

LOCAL

Stanislaus County

Stanislaus County has adopted a general plan and policies that support the preservation of Stanislaus County's cultural legacy of historical and archeological resources for future generations. In the introduction section of the general plan, goals are listed for each of the elements. Goal 8 in the Conservation/Open Space element states, “Preserve areas of national, state, regional and local historical importance.” The Land Use section of the plan allows a historical zoning to preserve areas of national, state, regional and local historical significance.

Implementing Measure 5 of Policy 24 in the Conservation/Open Space element states the following:

“The County shall utilize the California Environmental Quality Act (CEQA) process to protect archaeological or historic resources. Most discretionary projects require review for compliance with CEQA. As part of this review, potential impacts must be identified and mitigated.”

Implementing Measure 1 of Policy 25 in the Conservation/Open Space element states the following:

> “Whenever possible, the County Building Inspection Division shall utilize the provisions of the State Building Code that allow historical buildings to be restored without damaging the historical character of the building.”

City of Turlock

The General Plan of the City of Turlock establishes a policy for historic and archaeological resources (Turlock General Plan – Open Space and Conservation Element, page 30):

Guiding Policy

6.8a Protect significant archaeological resources in the Planning Area that may be identified during construction.

Implementing Policy

6.8-b Should archaeological or human remains be discovered during construction, work shall be immediately halted within 50 meters [164 feet] of the find until it can be evaluated by a qualified archaeologist. If it is determined to be historically significant, appropriate mitigation measures to protect and preserve the resources shall be formulated and implemented.

ENVIRONMENTAL SETTING

The project, as proposed, would be located on an 18-acre portion of a 69-acre parcel of land (zoned industrial) located at the western edge of Turlock, approximately 2.7 miles west of Highway 99, just south of West Main Avenue, off of Washington Road. The project site consists of relatively flat terrain that is currently under agricultural use. Industrial development exists on the north side, agricultural to the south and agricultural, residential and utility uses to the west. Presently, a major 115-kV transmission line that connects to the existing Walnut peaking plant and substation is adjacent to the plant site (TID 2002a, pages 1-3 and 1-4).

Refer to the **PROJECT DESCRIPTION** section of this Preliminary Staff Assessment for additional information and maps of the project development region and the project area.

PREHISTORIC SETTING

The proposed TID project is situated in the Northern San Joaquin Valley with the San Joaquin River to the West, the Tuolumne River on the North and the Merced River to the South. Upper San Joaquin Valley, south of Stockton is one of the least investigated areas of California (Morotto 1984, p. 215) Sites that have been identified appear to reflect the subsistence system practiced by the Northern Valley Yokuts who occupied the area when the Spanish arrived. The Northern Valley Yokuts utilized a riverine and savanna environment that was rich in salmon and acorns (Morotto 1984, p. 174). Early evidence estimates the population of the Central Valley to have been 105,000 with approximately 52,000 people living in the San Joaquin Valley (Morotto 1984, p. 171). However, information from the Turlock area is particularly limited.

Although there has been little work in the Turlock area, archaeological investigations have been conducted in other areas of the northern San Joaquin Valley. Extensive work has been completed in the Delta area near Stockton, and well to the south of the project, work has been conducted at Tulare Lake. Work at Knights Ferry (CA-STA-0617/H, northeast of the project) conducted in 1965 identified human remains and evidence indicating that human activity at the location extended to at least 2,500 and may extend as far as 3,000 yr. Before Present (BP) (TID 2003a, p. 8.3-8)

Approximately 30 miles to the north of the site, the extensive Farmington complex was identified dating to between12,000 to 7,000 years ago (Morotto 1984, p. 63). The complex contained two types of village sites and appeared to be an ancient lithic industry. Elsewhere in the county excavations have revealed evidence of three or possibly four prehistoric occupations (TID 2003a, p. 8.3-8). Additional sites were discovered in the areas of Los Banos Creek Reservoir, at Dos Palos in valley sediments and at the Kesterson National Wildlife Refuge.

The applicant cites Napton's study of the area for a proposed transmission line that concludes, " the proposed project area is in an environment considered to be of low to moderate sensitivity in respect to its potential to contain cultural resources." Given the information available regarding the area near the project, it is difficult to understand how this conclusion was reached.

It appears that archaeological work in the area is insufficient to support Napton's conclusion in light of information provided in Morotto that says "It is likely that most of the archaeology of the Central Valley habitation prior to circa 4000-5000 BC lies deeply buried under alluvium. This is especially true of the lower reaches of the San Joaquin and Sacramento River drainages where up to 10 meters (33 feet) of sediments have accumulated during the past 5000 to 6000 years. Such rapid alleviation would account for the deep burial of the Capay skeleton, Arcade Creek artifacts, many Windmiller components, and other remains of modest antiquity in Valley lowlands" (Morotto 1984, p. 214).

ETHNOGRAPHIC BACKGROUND

There is little information regarding Native American groups in the Turlock area. The project would be located in the territory previously occupied by the North Valley Yokuts. North Valley Yokut's territory spanned the area from the San Joaquin River bend to the north midway between the Calaveras and Mokelumne rivers to the lower Kings river. To the west, the probable boundary was the crest of the Diablo Range and the eastern boundary was the meeting of the Sierra foothills and the Central Valley floor. Historic accounts describe villages along the San Joaquin River as being well populated with storage areas for food (Wallace 1978, p. 462-463).

Subsistence for the North Valley Yokuts was likely to have centered around the procurement of salmon and processing of acorns (Morotto 1984, p.174). Other foods, grass and other seeds, roots, waterfowl, fish and turtles provided additional sources of nutrition (TID 2003, p. 8.3-11). Population tended to be clustered along the San Joaquin and other rivers and streams. Away from the rivers, population generally amounted to two or three persons per square mile, as estimated by Baumhoff (Wallace 1978, p. 463).

North Valley Yokuts appear to have participated in well-developed trade networks. Trails used for trade extended to Salinan territory and North Valley Yokuts traded with Plains Miwok and Coastanoan groups (Wallace 1978, p. 465). Known trade items included were baskets, bows and arrows, shells and dog pups.

Contacts with Europeans were as disastrous for the North Valley Yokuts as it was for other Native American groups in California. The Spanish began exploration of the San Joaquin River and delta early in the nineteenth century. Populations that had been decimated by disease and raiding by non-Natives were further reduced when a disease thought to be malaria struck in 1833. Miners heading for gold rush territory passed through the San Joaquin Valley on their way to the gold mines. Many who were not successful at mining returned to farm the valley successfully driving the remaining North Valley Yokuts from their land (Wallace 1978, p. 469).

HISTORIC SETTING

Spanish explorer Pedro Fages recorded information about the Central Valley in 1772. The Spanish began to aggressively explore the delta and the lower San Joaquin valley in the early 1800's. As the missionaries ran out of new converts in coastal areas, they extended their interest to tribes residing in inland areas. Although the Spanish intended to establish a network of missions in inland areas, they never reached that goal (Wallace 1978, p. 468).

Fur trappers from the East also entered the San Joaquin Valley in the early 1800's. Among the historically recognizable individuals were Jedediah Smith and Kit Carson. Trapping by the Europeans served to deplete the fur bearing animals by 1837 (TID 2003, p. 8.3-12).

After the Mexican Revolution a new constitution was adopted in 1824, granting political and racial equality to everyone including Native Americans. In California, the liberal ideals expressed in the constitution resulted in freer trade with foreigners, beginning secularization of the missions and an increase in rancho land grants including some to Native peoples (Rawls & Bean 1993, p. 45). Governors were appointed by Mexico and exercised most of the judicial authority in important matters. In reality, the authority in California was a group of mostly California born ranchero families.

Secularization of the missions resulted in most of the mission holdings passing into private ownership and there were approximately 500 ranchos in California during the Mexican period (Rawls & Bean 1993, p.52). Few of the landholders were literate. Out of an estimated population of 7,000 (non-Indian), in 1845, probably only 100 could read or write (Rawls & Bean 1993, p. 55).

During the Mexican period Europeans were also settling in California. Between 1841 and 1846 wagon trains journeyed to California. In 1846, the United States declared war on Mexico. In 1848, Mexico ceded California to the United States under the treaty of Guadalupe Hidalgo (Rawls & Bean 1993, p. 80; TID 2003, p. 8.3-13).

Gold was discovered in California on January 24, 1848. At first over half the miners were Indian, but hostilities between Indians and white settlers increased and the number of Indian miners decreased. By the end of 1849, potential miners were swarming over the foothills (Rawls & Bean 1993, p. 88).

California became a state in 1850. People unable to strike it rich in the mines turned to other activities. They became farmers, laborers and shopkeepers. Land was rich in much of the Central Valley. Intensive agriculture needed water and in 1897, the Turlock Irrigation District was established (TID 2002, p.8.3-13). Transportation and irrigation were of major importance in Turlock's development. The first of Turlock's Irrigation projects was completed in 1893. Water arrived in 1900. The flow of water in 1901, and the development of a community ditch system that began in 1903 and 1904, enabled the development of intensive agriculture in the Turlock area. The City of Turlock was established six months after the Central Valley Railroad was built in 1870. The growth of particular crops depended on the availability of water. At various times the primary crops in the region were wheat, melons and grapes. Reflecting California as a whole,

Turlock was home to a large influx of immigrants. Categories of immigrants included Swedes, Portuguese, Assyrians and Japanese (CH2Mhill 2003c, DPR 523).

Although Turlock as a whole seems to have depended on irrigation canals, the TID area is an exception. Early in the 1900's, the area was very swampy and farmers only had to dig a hole about three feet deep to reach water. After pumps were installed, the water table dropped and the land could be farmed (CH2Mhill 2003c, DPR 523).

After 1920, Turlock remained focused on agriculture and the repair of essential canals continued. In 1944, piping began to replace the canals with many miles of piping installed by 1951 (CH2Mhill 2003c, DPR 523). In 1970, the population of Turlock was 13,992 and today it is over 59,000 (Turlock 2003, Web Page).

RESOURCES INVENTORY

Literature and Records Search

Prior to preparation of the AFC, the TID commissioned a cultural resources literature search for a one-mile area around the project site and linears to be completed by the California Historical Resources Inventory System (CHRIS), Central California Information Center. The CHRIS provided the results on July 31, 2002 and August 26, 2002, noting that no archeological sites were recorded in the area searched, no historic properties (cultural resources found eligible for the National Register of Historic Places) were within the study area, that portions of the Tidewater Southern Railway are within the study area (recorded in other areas), that a trail or road appears on an 1853-1854 Government Land Office (GLO) Plat within the study area, and that 9 previous inventories have overlapped potions of the study area (negative results). TID also identified one of their canals, Lateral No. 5, as a cultural resource over 50 year of age (TID 2001a, page 8.3-17 and Confidential Appendix 8.3D).

Field Surveys

Plant Site and Laydown Area

TID performed an intensive pedestrian survey (archaeological) of the 69-acre parcel that includes the 18-acre plant site (WEC) and the 51-acre laydown area using 30 meter (100 foot) transects. The survey did not identify cultural resources within the 69-acre parcel. Just north of the plant site, the surveyors identified and recorded a portion of the Turlock Branch of the Tidewater Southern Railway on Department of Parks and Recreation Form 523 (TID 2001a page 8.3-18).

Natural Gas Pipeline

The natural gas pipeline would extend from the plant site west along the railroad tracks, to South Commons Road, then south to West Bradbury Road where it would tie into the PG&E main pipeline, Line 215.

The archeological survey of the gas pipeline used 30 meter (100 foot) transects covering 100 feet on each side of the gas pipeline centerline. The surveyors noted that the gas pipeline passes across the irrigation canal Lateral No. 5 and the recorded location of the historic trail/road on the 1853-1854 GLO Plat. No indications of a road or

trail could be found in the vicinity of the marked location on the 1853-1854 GLO Plat. The Lateral No. 5 was recorded (TID 2001a page 8.3-18).

Water Routes

The recycled water line would extend from the WEC plant site south to Ruble Road, east to South Tenger Road, south about 400 meters (1,200 feet), then east along an existing electrical easement toward South Kilroy Road and to the wastewater treatment plant. The potable water line follows the same route form the plant site south to Ruble Road and then east to South Tegner Road.

The archeological survey of the water lines used 30 meter (100 foot) transects covering 100 feet on each side of the water pipeline centerline. No cultural resources were observed (TID 2001a page 8.3-18A).

Architectural/Historical Reconnaissance

As part of the WEC project, the TID also provided an inventory and evaluation of buildings and structures from the historic period. The inventory included all structures more than 45 years old within a mile of the WEC project. The information in **Table 1** was provided by CH2MHill (CH2Mhill 2003c).

Table 1 Cultural Resources within the Walnut Energy Center Phase I				
#	Accessor Parcel No.	Street Address	Date of Construction	Recommended Eligibility
1	044-02-14	5600 Clayton Road	1930	Not eligible
2	044-12-02	5519 Harding Road		Not eligible
3	044-01-28	207 Holland Drive	1940	Not eligible
4	044-01-05	331 Holland Drive	1948	Not eligible
5	044-10-11	1037 Kilroy Road	Undetermined	Not eligible
6	044-15-02	2606 Linwood Avenue	1949	Not eligible
7	044-10-07	2719 Linwood Avenue	1925	Not eligible
8	044-13-06	3606 Linwood Avenue	1900	Not eligible
9	044-04-14	3613 Linwood Avenue		Not eligible
10	044-01-16	649 S. Commons Road	1920	Not eligible
11	044-02-08	818 S. Commons Road	1908	Not eligible
12	044-02-22	1230 S. Commons Road	1930	Not eligible
13	044-40-21	3700 S. Commons Road	1966*	Not eligible
14	044-40-24	4724 S. Commons Road	1914	Not eligible
15	044-04-16	825 South Tegner Road	1910	Not eligible
16	044-10-48	830 South Tenger Road	1937	Not eligible
17	044-01-12	715 Washington Road	1920	Not eligible
18	044-04-01	806 Washington Road	1935	Not eligible
19	044-02-11	1201 Washington Road	1925	Not eligible
20	044-04-02	1318 Washington Road	1947	Not eligible
21	089-10-07	3707 West Main Street	1910	Not eligible
22	044-03-02	3900 West Main Street	1908	Not eligible
23	089-10-10	4231 West Main Street	1915	Not eligible
24	089-10-16	4625 West Main Street	1961*	Not eligible
25	089-10-17	4631 West Main Street	1953	Not eligible
26	089-10-13	4713 West Main Street	Undetermined	Not eligible
27	023-40-07	4813 West Main Street	1911	Not eligible
28	044-01-08	5024 West Main Street	1956*	Not eligible
29	044-01-07	5118 West Main Street	1949	Not eligible
30	023-40-08	5213 West Main Street	1955	Not eligible
31	023-40-09	5438 West Main Street	1973	Not eligible
32		Tidewater Southern Railway, Turlock Branch	No Date available	Not eligible
33		Canal Lateral No, 5	1903	Eligible (CRHR and NRHP)

* Building appears older than indicated in tax records.

Native American Contacts

CH2MHill contacted the Native American Heritage Commission (NAHC) on August 19, 2002, and received contact information about interested Native Americans on September 5, 2002. They subsequently sent letters to the two individuals on the list but have not received replies. The search of the Sacred Lands database conducted by the

NAHC indicated that there were no sacred sites listed in their database in this area. TID has made no additional contacts.

CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize cultural resources by determining whether they meet sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the cultural resources and the methods and consultation required to mitigate any such impacts. Federal laws apply when a federal agency takes an action. The federal agency will comply with the applicable federal laws. No federal agency has been identified that will take an action for this proposed power plant. If a federal agency is required to take an action, they are responsible for compliance with federal regulations.

Under federal law, only historical or prehistoric sites, objects, or features, or architectural resources that are assessed as “significant” in accordance with federal guidelines need to be considered in analyzing potential impacts. The significance of historical and prehistoric cultural resources is based on the criteria for eligibility for nomination to the National Register of Historic Places (NRHP) as defined in Title 36 Code of Federal Regulations, section 60.4. If such resources are determined to be significant, and therefore eligible for listing in the NRHP, they are afforded certain treatment under the National Historic Preservation Act. If the resources are determined significant, and therefore eligible for the CRHR, then mitigation measures are implemented under CEQA to reduce the impact to less than significant if possible. Federal agencies are responsible for meeting the requirements of NHPA and the Energy Commission is responsible for meeting the requirements of CEQA.

The National Register criteria state that “eligible historic properties” are: districts, sites, building, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

a) are associated with events that have made a significant contribution to the broad patterns of our history; or

b) that are associated with the lives of persons significant in our past; or

c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d) that have yielded, or may be likely to yield, information important to history or prehistory. Isolated finds by definition do not meet these criteria.

California has adopted a very similar set of criteria for assessing resources for the California Register of Historical Resources.

Under federal law, cultural resources determined not to be significant, that is, not eligible for National Register listing, are subject to recording and documentation only, and are afforded no further treatment. 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. Energy Commission staff and involved federal agencies evaluate the survey reports and site records for any known resources located within or adjacent to the project Area of Potential Effects (APE) to determine whether they meet the eligibility criteria.

The record and literature search and the pedestrian surveys of the proposed project APE were conducted to identify the presence of any cultural resources. Where cultural 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 determination of eligibility is made in compliance with the applicable provisions of the National Historic Preservation Act.

CEQA Guidelines explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect “historical resources.” The guidelines provide a definition for historical resources and set forth a listing of criteria for making this determination. These criteria are the eligibility criteria for the CRHR and are essentially the same as the eligibility criteria for the NRHP. In addition, as with the NRHP, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Resources eligible for the CRHR may have less integrity than the resources eligible for the NRHP. If the criteria are met and the resource is determined eligible for the CRHR, the Energy Commission must evaluate whether the project will cause a “substantial adverse change in the significance of the historical resource,” which the regulation defines as a significant effect on the environment.

CEQA also contains a section addressing “unique” archeological resources and provides a definition of such resources (Public Resources Code, Section 21083.2). This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the limitations in this section do not apply when an archeological resource has already met the definition of an historical resource (Title 14, California Code of Regulations, Section 15064.5).

ANALYSIS AND IMPACTS

Since project development and construction entail surface and subsurface disturbance, the proposed WEC has the potential to adversely affect both known and unknown cultural resources. Staff has analyzed the potential direct, indirect, and cumulative impacts from the proposed project. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation or demolition. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or vandalism due to improved accessibility. Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Although the existence of known cultural resources increases the potential for additional resources, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur.

PROJECT SPECIFIC IMPACTS

Archaeological Resources

The archaeological inventories for the plant site and linear components did not record any archaeological sites within the project impact area. Therefore, staff does not expect impacts to known archaeological resources.

Historical Structures and Infrastructure

TID identified 33 historical buildings and structures within the project area (**Table 1**). Few buildings and structures are eligible for information values. None of the buildings or structures identified in the survey suggests that they would contain information valuable for history. None of the buildings or structures are considered to contain information sufficient to meet the eligibility requirements for the CRHR under Criterion 4.

TID has provided a context with the Department of Parks and Recreation (DPR) Form 523 within which the eligibility of the buildings and structures can be weighed under criteria other than Criterion 4. The context identifies the period of significance for events (CRHR Criterion 1) as between 1905-1920. The context also identifies some of the important individuals (CRHR Criterion 2) in the development of Turlock. The context does not provide parameters for architecture (CRHR Criterion 3).

Staff has reviewed the analysis provided by TID and agrees they have demonstrated that the buildings and structures 1, 3, 4, 6, 7, 8, 12, 16, 19, 25, and 29 do not meet the eligibility requirements under Criteria 1 and 2 for the CRHR because they are clearly outside of the period of significance (**Table 2**).

These buildings and structures represent several styles of architecture, generally modest forms of styles found throughout central California. These residential buildings and farm structures were usually not designed by an architect. Consequently, they do not represent the work of a master, possess high artistic beauty, or represent a cohesive style of construction that would represent a district. These do however, represent vernacular versions of several styles of architecture. Some of the buildings, 1, 3, 4, 5, 7, 8, 12, 16, 19, 25, and 29, have been altered sufficiently (e.g. replacement of wood casing windows with aluminum sliders, enclosing of porches, addition of aluminum screendoors, original siding covered with newer siding, significant additions to building, removal of character defining elements such as gas pumps) that they no longer retain enough physical integrity to be considered to be eligible for the CRHR under Criterion 3 (**Table 2**). These changes represent a significant loss of integrity in design, materials, and workmanship and some loss of feeling and association. In addition, there may be some loss of integrity because of a change in setting (rural to

industrial) depending on the changes that have taken place since a particular building was constructed (less change for more modern buildings) and the proximity of modern intrusions.

Table 2
Cultural Resources within the Walnut Energy Center Phase I

#	Accessor Parcel No.	Street Address	Date of Construction	Eligibility Criteria*			
				1	2	3	4
1	044-02-14	5600 Clayton Rd	1930	N	N	N	N
2	044-12-02	5519 Harding Rd	1908	U	U	U	N
3	044-01-28	207 Holland Dr	1940	N	N	N	N
4	044-01-05	331 Holland Dr	1948	N	N	N	N
5	044-10-11	1037 Kilroy Rd	Undetermined	N	N	N	N
6	044-15-02	2606 Linwood Ave	1949	N	N	U	N
7	044-10-07	2719 Linwood Ave	1925	N	N	N	N
8	044-13-06	3606 Linwood Ave	1900	N	N	N	N
9	044-04-14	3613 Linwood Ave	1967*	N	N	N	N
10	044-01-16	649 S. Commons Rd	1920	N	N	N	N
11	044-02-08	818 S. Commons Rd	1908	U	U	U	N
12	044-02-22	1230 S. Commons Rd	1930	N	N	N	N
13	044-40-21	3700 S. Commons Rd	1966*	N	N	N	N
14	044-40-24	4724 S. Commons Rd	1914	U	U	U	N
15	044-04-16	825 South Tegner Rd	1910	U	U	U	N
16	044-10-48	830 South Tegner Rd	1937	N	N	N	N
17	044-01-12	715 Washington Rd	1920	N	N	N	N
18	044-04-01	806 Washington Rd	1935	N	N	U	N
19	044-02-11	1201 Washington Rd	1925	N	N	N	N
20	044-04-02	1318 Washington Rd	1947	N	N	U	N
21	089-10-07	3707 West Main St	1910	U	U	U	N
22	044-03-02	3900 West Main St	1908	U	U	U	N
23	089-10-10	4231 West Main St	1915	U	U	U	N
24	089-10-16	4625 West Main St	1961*	N	N	N	N
25	089-10-17	4631 West Main St	1953	N	N	N	N
26	089-10-13	4713 West Main St	Undetermined	N	N	N	N
27	023-40-07	4813 West Main St	1911	U	U	U	N
28	044-01-08	5024 West Main St	1956*	U	U	U	N
29	044-01-07	5118 West Main St	1949	N	N	N	N
30	023-40-08	5213 West Main St	1955	N	N	U	N
31	023-40-09	5438 West Main St	1973	U	U	U	N
32	Not available	Tidewater Southern Railway, Turlock Branch	No Date available	N	N	N	N
33	Not available	Canal Lateral No, 5	1903	A			

* N= does not meet eligibility requirement, U= undetermined, Y= meets eligibility requirement, A= assume to meet the eligibility requirement

5519 Harding Road

Structure 2 at 5519 Harding Road is a barn with corrugated metal siding and roofing. TID indicates that the building is not eligible for the CRHR because the building is architecturally undistinguished, and the corrugated metal was not customarily associated with buildings constructed in 1908.

Corrugated metal was produced by firms such as the New York Iron Roofing and Corrugating Company which was founded in 1887 before this barn was constructed (Corrugated Metals, Inc. 2003, web page). In addition, the production of corrugated metal was of sufficient quantity that it was exported from the United States to the Virgin Islands as early as 1892. U.S. Steel's galvanized corrugated steel was widely used in the islands by 1917 (Metal Home Digest 1998, web page). Corrugated metal products were available and in use in California in 1904 (The Chinese American Museum in Los Angeles 2003, web page).

Since corrugated iron was available in California when structure 2 was built. This structure could have been clad with corrugated iron when it was built. If that is the case, this might be a very early example of this use and could qualify for the CRHR under Criteria 1 and 3. However, it is unlikely that this barn would be impacted by the pipeline construction. The proximity of the construction easement to this barn will need to be determined in order to find out whether further evaluation of the structure is required for the Final Staff Assessment. If the barn could be impacted, further evaluation will be required for the Final Staff Assessment.

2606 Linwood Avenue

This house (building 6) was built outside of the period of significance and does not contain information values (Criterion 4). Therefore, it is not significant under Criteria 1, 2, and 4 as previously noted. However, the house appears to retain good physical integrity (location, design, materials, workmanship). The setting would be altered by the addition of the power plant. However, directly north of the power plant, is the Foster Farms silo, which has already altered the setting of this building. The addition of the power plant would only incrementally change the setting from rural to industrial. The power plant would also diminish the feeling since it alters the historic sense of the period when the house was built. The alteration of the setting and feeling would not be sufficient to materially impair the eligibility of this residence if it is significant.

3613 Linwood Avenue

The tax record used by TID to identify the age of this building (# 9) is not accurate. The architecture of the building suggests it was built during the period of significance. Alterations of the front façade include the installation of an aluminum frame screen over the double sash window, an aluminum screen door, an evaporative cooler, and an attic fan. Other more recent buildings in the vicinity of this parcel (along Linwood Avenue and Tegner Road) have diminished the setting. All of the alterations and changes have diminished the integrity of design, setting, materials, workmanship, feeling, and association. The loss of integrity is such that this building would not meet the eligibility requirements for the CRHR under any criteria.

649 S. Commons Road

Building 10 has been modified with the addition of an arbor to the front façade, breaking up the visual character of this façade. The roofing material has been changed to either a red tile or other modern material. There is a railing, a roof railing and a chimney visible on the left side of the house that represents a sizable addition. Some windows have been replaced with modern aluminum frames. The in filling of more modern houses along South Commons Road and on Holland Road have changed the setting of this house. The change in the roofing material, the addition of the arbor, the room addition on the left of the building, the replacement of windows, and the addition of more houses in the vicinity of this building has diminished the integrity of design, setting, materials, workmanship, feeling, and association. The loss of integrity is such that this building would not meet the eligibility requirements for the CRHR under any criteria.

818 S. Commons Road

Building 11 has had some windows replaced, some siding replaced, and a tall television antenna placed on the roof. Some of the newer siding is the same type of siding as the original and a few pieces are of a different type. TID indicates that the windows in the front of the house are new. They appear to be double hung, or at least two lights (one over one). Two windows on the right side of the house are now sliders, not in character with the original style of the house. The paint on the house is peeling in places and some new siding is unpainted.

This house still retains integrity of location. The integrity of design is slightly diminished. The design changes only appear to be the replacement of the windows and siding on the right side of the house. The setting has been diminished with the addition of more modern houses along South Commons Road and on Holland Road. The proposed power plant is nearly a mile away, which would diminish the setting slightly. The Foster Farms silos are immediately north of the plant site, having already caused some loss of integrity of setting. The house has lost some of the original materials (windows and siding), although the replacement items are visually similar to the original materials. Some integrity of workmanship has been lost with the changes in materials, although this is relatively minor. The changes and lack of maintenance have diminished the aspects of feeling and association only slightly. In all, this building has not lost much integrity.

The construction of the power plant would reduce the integrity of setting to a minor degree, not sufficient to materially impair the eligibility of the house. The gas pipeline would be placed near the residence. It is unlikely that this building would be impacted by the pipeline construction. The proximity of the construction easement to this barn will need to be determined in order to find out whether further evaluation of the structure is required for the Final Staff Assessment. If the barn could be impacted, further evaluation will be required for the Final Staff Assessment.

3700 S. Commons Road

TID provided information from tax records that indicate the building (# 13) was constructed in 1966. It is more likely that extensive alterations were made to the front façade of the building in 1966. The entire front of the building appears to be covered

with modern plywood siding. The doors are modern metal doors, and the windows are aluminum frame sliders. The front of the building does not retain any of its original features, seriously diminishing the character of the entire building. The sides of the building appear to have older siding probably dating to the original construction of the building. The windows on the side of the building also appear to be aluminum sliders. There is an HVAC unit on the roof and a large television antenna. The alterations to this building have altered the character defining elements to such a degree that the building no longer retains integrity and would not meet the eligibility requirements of the CRHR under any of the Criteria.

4724 S. Commons Road

This building, number 14, was constructed in the period of significance. The major alteration to this building is the addition of the staircase and door to the north side of the house, a new front door, aluminum frame screens on most of the windows, tall television antenna on the roof, and an addition that connects the rear of the house to a newer garage in the rear. The upper portion of the porch posts is a curved rectangle. This is an unusual configuration for this architectural style. This could be a modification after the period of significance. The building retains integrity of location. The integrity of design materials, workmanship, feeling and association has been diminished with the additions and modifications. The setting has been slightly diminished with the addition of newer buildings such as the garage. The integrity may not have been sufficiently diminished to materially impair the eligibility of the resource.

The building is over a mile from the plant site and the addition of the plant would not significantly change the setting such that the eligibility of the residence would be materially impaired. The proposed activity near this house is the construction of the gas pipeline. It is unlikely that this building would be impacted by the pipeline construction. The proximity of the construction easement to this house will need to be determined in order to find out whether further evaluation of the structure is required for the Final Staff Assessment. If the building could be impacted, further evaluation will be required for the Final Staff Assessment.

825 South Tegner Road

Building 15 has had rather minor alterations: a newer front door, the porch posts may have been replaced, one window has been changed to an aluminum slider on the right side of the house, an air conditioner has been added to one of the upstairs dormers and to the downstairs, a tall television antenna rests on the roof, and the center section of the rear of the house has been filled in and a newer door added. The house retains integrity of location. Most of the integrity of design is intact. The setting is already diminished with the in filling of other residences to the south, the newer residence across the street, the Foster Farms silos to the west and industrial buildings about a quarter mile to the north. The proposed power plant may be visible to the west, but it would be very close to the Foster Farm silos. The setting has already been diminished around this building. The integrity of materials, workmanship, feeling and association has only been slightly diminished. It is not clear that this building has lost a significant amount of integrity that its eligibility is materially impaired. However, since the setting is already lost most of its integrity because of in filling of more modern houses to the south and east, industrial/commercial buildings to the north and the Foster Farms silos to the

west, the proposed power plant would only diminish the setting to a slight degree. This would not materially impair the eligibility of this building.

715 Washington Road

This house (building 17) has had all of the windows replaced with aluminum sliders. A heavy screen door obscures the front door. The windows to the left of the front door may have been added as they appear out of character with the rest of the building. The skirt of the building has been removed to the left of the front steps and along the left side of the house. A television antenna is attached to the left side of the house and a small satellite dish is adjacent to the left side of the house. An evaporative cooler has been installed on the front of the house just to the right of the entrance area. A newer door has replaced the original back door. A storage shed sits just behind the house. The setting has been altered with tall power poles and high voltage wires near the front of this building.

Some of the character defining elements of this house have been altered: removal of skirting, replacement of the windows, and addition of a heavy security screen door. The addition of the evaporative cooler adds another major modification to the front façade of the house. These changes have severely altered the integrity of the house. The integrity of location is still intact, but design, setting, materials, workmanship, feeling and association have all been seriously diminished. Sufficient integrity has been lost that this building would not meet the eligibility requirements for the CRHR under any of the criteria.

806 Washington Road

This building (# 18) would not meet eligibility requirements for the CRHR under Criteria 1, 2, or 4 as previously stated. The house has had several alterations: awnings over front door and over the windows on left and rear of house, a security type screen door on the back entrance, a security light over the front porch, heavy hand rails on each side of the front door, and a television antenna on the roof. Aluminum frame screens have been added to most of the windows, but the double hung windows are still visible through the screens. The setting has been somewhat altered by in filling near the house, tall transmission towers and high voltage lines, to the north and the Foster Farms silos to the east. The proposed power plant would add to the industrial nature of the setting to the east. However, this would not be a significant change to the already altered setting of this resource. The addition of the plant and more power lines would not be a significant change to the setting and would not materially impair the eligibility of this building.

1318 Washington Road

This building (building 20) would not meet eligibility requirements for the CRHR under Criteria 1, 2, or 4 as previously stated. There have been some window replacements in this house and the entrance may have been altered. The construction of a new power plant would alter the setting and feeling of this resource. The plant would be to the northeast of this building, and the Foster Farms silos, other silos, and the cheese factory already visually dominate this area. The addition of the power plant would further diminish the integrity of setting and feeling, but it would be to such a small degree that it would not materially impair the eligibility of this resource.

3707 West Main Street

This house (building 21) appears to have been modified by enclosing the front porch and adding windows and a new front door. This is a serious loss of integrity of design. The remainder of this small house appears to retain good integrity of materials, workmanship, and feeling although all of these aspects of integrity are reduced because of the enclosing of the front porch. The setting of the building has been altered with the in filling of newer buildings to the east, south, west and northwest. Industrial buildings, silos and the cheese factory, already dominate the area to the south where the new plant is proposed. The addition of the power plant would further degrade the integrity of setting although it would be only a slight loss of the integrity of setting. This loss of setting would not materially impair the eligibility of this resource if it were eligible for the CRHR.

3900 West Main Street

This house (# 22) appears to have been modified by enclosing the front porch and adding windows and a new front door. This is a serious loss of integrity of design. The remainder of this house appears to retain good integrity of materials, workmanship, and feeling although all of these aspects of integrity are reduced because of the enclosing of the front porch. The setting of the building has been altered with the in filling of newer buildings to the east and north. Industrial buildings, silos and the cheese factory, already dominate the area to the south where the new plant is proposed. The addition of the power plant would further degrade the integrity of setting to a slight extent. This loss of setting would not materially impair the eligibility of this resource if it were eligible for the CRHR.

4231 West Main Street

This house (building 23) has had portions of it covered with modern siding. The front porch has vertical siding on it, which is not consistent with the rest of the house. This is probably an alteration outside of the period of significance. The house appears to retain some integrity of design, materials, workmanship, and feeling although all of these aspects of integrity are reduced because of the alterations. The setting of the building has been altered with the in filling of newer buildings to the east and west. Industrial buildings, silos and the cheese factory already dominate the area to the south where the new plant is proposed. The addition of the power plant would further degrade the integrity of setting to a slight extent. This loss of setting would not materially impair the eligibility of this resource if it were eligible for the CRHR.

4625 West Main Street

TID provided information from tax records that indicate this building (# 24) was constructed in 1961. This is more likely to be when a large addition was built on the east side of the original building. This building appears to have originally been a hipped roof masonry block building. The addition is about the size of the original building with a nearly flat roof. Although the addition is slightly set back from the front of the original building, the size and massing of the building is significantly altered. The building only retains its integrity of location. Design, setting, materials, workmanship, feeling and association have lost significant integrity and this building would not meet the eligibility requirements for the CRHR under any of the criteria.

4631 West Main Street

This building (building 25) was originally a service station and is now operated as a hardware store and auto repair shop. The pump island remains in front of the building although the pumps have been removed. On the left side of the masonry block building is a board and batten addition. The addition increases the footprint of the building by about 25 percent. The addition is set back from the front of the building. Plastic letters are attached to the side of the building advertising its name and function. Signs have been placed above the door and each of the front windows. The letters and signs are out of character with the period of the construction.

Having lost the gas pumps, one of the character defining elements of this building type, and having a large addition at the side, the building has lost a significant amount of integrity of design, setting, materials, workmanship, feeling and association. This building would not meet the eligibility requirements for the CRHR under any of the criteria.

4713 West Main Street

The Moose Lodge (building 26) is made up of an old school and a new addition. The construction date for the school building is not known. The school building has a hip roof and panel walls broken by dominant vertical columns faces West Main Street. The concrete stairs and railings on the north side of the building appear to be original to this school building. The taller section of the school building was probably the gymnasium that would most likely have been windowless. A small wall air conditioner has been installed on the east side of the school building. A tall television antenna is visible above the building as well as the “Moose” sign over the door. The HVAC units on the new addition can been seen over the school building. An addition has been added to the north side of the school building, doubling the footprint of the building. The addition has a flat roof with sloping sides. There are no windows in either part of the building.

The removal of windows from the classroom section of the school building removed one of the very important character defining attributes of a school. The large addition also has changed the design, setting, materials, workmanship, feeling and association to such a degree that this building would not meet the eligibility requirements for the CRHR under any of the criteria.

4813 West Main Street

Building 27 is a well cared for residence and a well-maintained well/tank house behind the residence. Some windows have been replaced with aluminum sliders and large single glass lights. An air conditioner has been added to an upstairs window. Awnings cover the upper portion of many of the windows. A flat roofed carport has been added behind the house. The barn further to the back of the parcel is also in good shape.

TID indicates that the property has a good deal of integrity. Even with the intrusion of the carport, alteration of some windows, addition of awnings and air conditioners, the integrity of design, materials, workmanship, feeling and association is good. With this resource the aspect of integrity that would be most changed by the proposed power plant is the setting. The power plant would be built to the southeast of this parcel.

Immediately adjacent to the parcel is a traffic signal and about a half-mile further are the Foster Farms silos. Other silos and industrial facilities dominate the skyline to the east and southeast. The setting in this direction has already lost significant integrity. The construction of the proposed power plant would further degrade the integrity of setting to a slight extent. This loss of setting would not materially impair the eligibility of this resource if it were eligible for the CRHR.

5024 West Main Street

This residence (building 28) is older than the tax record information provided by TID. The hose has had some alterations with the replacement of original windows with aluminum sliders, the covering of the vent or window on the upstairs dormer, and the placement of the television antenna on the roof.

Even with the alteration of some windows and the addition of the antenna, the integrity of design, materials, workmanship, feeling and association is good. With this resource, the aspect of integrity that would be most changed by the proposed power plant is the setting. The power plant would be built to the east-southeast of this parcel. About a half-mile to the east-southeast are the Foster Farms silos. Other silos and industrial facilities dominate the skyline to the east and southeast. The setting in this direction has already lost significant integrity. The construction of the proposed power plant would further degrade the integrity of setting to a slight extent. This loss of setting would not materially impair the eligibility of this resource if it were eligible for the CRHR.

5213 West Main Street

This residence (# 30) is a well-maintained masonry block building which appears to have all original windows and doors. The porch roof is supported by two metal posts and has a low “L”-shaped wall on two sides. The low wall is probably a later alteration to the house. This appears to be the only alteration, representing a minimal diminishment of the integrity of design, materials, workmanship, and feeling.

The alteration of the porch represents a minimal loss of integrity of design, materials, workmanship, feeling and association. With this resource, the aspect of integrity that would be most changed by the proposed power plant is the setting. The power plant would be built to the east-southeast of this parcel. About a half-mile to the east-southeast are the Foster Farms silos. Other silos and industrial facilities dominate the skyline to the east and southeast. The setting in this direction has already lost significant integrity. The construction of the proposed power plant would further degrade the integrity of setting to a slight extent. This loss of setting would not materially impair the eligibility of this resource if it were eligible for the CRHR.

5438 West Main Street

The Santos Diary (# 31) is made up of several buildings: a residence, a milking shed, barn and other outbuildings. TID indicated that the tax records date this resource to 1973. The siding and window styles of the residence and the barn suggest that this is not an accurate date for the original construction of some of the buildings. There may have been a permit approved in 1973 for renovations that would have required an update of the tax records.

These buildings are in a similar location as others already discussed on West Main. With this resource, the aspect of integrity that would be most changed by the proposed power plant is the setting. The power plant would be built to the east-southeast of this parcel. About a half-mile to the east-southeast are the Foster Farms silos. Other silos and industrial facilities dominate the skyline to the east and southeast. The setting in this direction has already lost significant integrity. The construction of the proposed power plant would further degrade the integrity of setting to a slight extent. This loss of setting would not materially impair the eligibility of this resource if it were eligible for the CRHR.

Tidewater Southern Railway, Turlock Branch

The character defining attributes of a railway (structure 32) built in 1916 would consist of rails, ties, rail ballast, and crossing signs through a relatively rural environment until entering each of the small cities on the route. Although rails have been upgraded and ties have been replaced, the rail bed still retains some of the character defining attributes. The crossings have been automated and the crossing signs have been changed significantly. The setting has changed the most with the development of numerous industrial and commercial buildings between Holland Drive and Kilroy Road. High voltage power lines cross the tracks at Washington Road and the Walnut substation and Walnut Power Plant are on the north side of the tracks between Holland Drive and Washington Road.

This segment of the Tidewater Southern Railroad still retains its integrity of location but it has lost a minor amount of design. The setting of the railroad at this location is significantly diminished, materials have been altered, workmanship has diminished to some degree, and the feeling and association have diminished significantly. The integrity of this section has been reduced to the extent that if the entire railway were eligible for the CRHR, this segment would not contribute to the eligibility of the overall resource.

Canal Lateral No, 5

TID suggests Canal Lateral No. 5 (structure 33) is significant in the local history and the development of irrigation agriculture in Turlock. The period of significance is 1905 to 1920, the period of growth and development. The canal lateral was an open earthen canal during the period of significance. The canal was lined with concrete in the 1930s. TID maintains that the canal maintains sufficient integrity to be eligible for the CRHR due to its association with irrigation agriculture in California.

The gas pipeline would cross the canal near the intersection of South Commons Road and Harding Road. The construction would be open cut during the dry season or by jack and bore or directional drilling during the wet season. If jack and bore or directional drilling is used there should be no impact to the resource. If the construction occurs during the dry season, and the open cut method of construction is used, the canal would be cut by the trench. Since the canal was lined with concrete after the period of significance, removal of a small portion of the concrete and repairing it would not change any of the original materials. Likewise, workmanship from the period of significance would not be changed, nor would the feeling change. Therefore,

construction of the gas pipeline would not materially impair the eligibility of the Canal Lateral No. 5.

Full mitigation measures can not be determined until it is clear that the buildings and structures at 5519 Harding Road, 818 South Commons Road, and 4724 South Commons Road are either outside of the construction easement or are fully evaluated for the CRHR. Staff will request information regarding the location of the pipeline, the area of the construction easement, laydown and other ancillary areas, and the measures that might be needed to ensure that the buildings will not be impacted by the construction. If the buildings can not be avoided, additional requests to clarify the evaluation of the buildings and structures will be necessary to determine their eligibility and possible impacts. This will be resolved in the Final Staff Assessment.

CUMULATIVE IMPACTS

Because the impacts to cultural resources as a result of the Walnut Energy Center project have not been fully determined, the cumulative impacts can not be concluded to this resource category. Cumulative impacts to cultural resources cannot be determined until the impacts have been determined. If impacts occur then resources identified in the project area have been evaluated and impacts to any eligible cultural resources have been analyzed. This will be resolved in the Final Staff Assessment.

IMPACTS OF FACILITY CLOSURE

The anticipated lifetime of the Walnut Energy Center is approximately 30 years. Upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned orderly closure that would occur when the plant becomes economically non-competitive.

At the time of planned closure, all then-applicable LORS would be identified and the closure plan required by the Energy Commission would 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 likely to depend upon the final location of project structures in relation to existing resources, and upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no conclusion can be drawn at this time with respect to the impact of facility closure on cultural resources. The closure plan, when created, would address impacts to cultural resources.

A temporary closure should have no impacts on cultural resources as long as no additional lands are needed for the closure. A contingency plan for temporary cessation of operation would be implemented that would ensure compliance with all applicable LORS.

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb

the ground to accomplish project closure and facility removal, some disturbance of known and/or previously unknown cultural resources might result.

COMPLIANCE WITH APPLICABLE LORS

Stanislaus County and the City of Turlock have policies and goals for the protection of cultural resources, but has no specific procedures for implementation of CEQA that differ from procedures used by the Energy Commission. Implementation of the mitigation measures recommended in the conditions of certification would ensure compliance with state and local LORS.

MITIGATION

For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often, however, avoidance cannot be achieved and other measures such as surface collection, subsurface testing, and data recovery must be implemented for archaeological resources and documentation must be implemented for historical structures. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

Full mitigation measures can not be determined until it is clear that the buildings and structures at 5519 Harding Road, 818 South Commons Road, and 4724 South Commons Road are either outside of the construction easement or are fully evaluated for the CRHR. Staff will request information regarding the location of the pipeline, the area of the construction easement, laydown and other ancillary areas, and the measures that might be needed to ensure that the buildings will not be impacted by the construction. If the buildings can not be avoided, additional requests to clarify the evaluation of the buildings and structures will be necessary to determine their eligibility and possible impacts.

Staff will request additional information from TID regarding the location of the construction easement and other ancillary areas to the buildings and structures at 5519 Harding Road, 818 South Commons Road, and 4724 South Commons Road. If any of the buildings or structures are within the easement or other ancillary areas needed for the project, then additional information will be requested to complete the evaluation of any impacted building or structure.

APPLICANT'S PROPOSED MITIGATION

Archaeological Resources

The applicant recommends avoidance of cultural resources. They do not recommend monitoring of construction although they are not opposed to such a requirement. They do not recommend Native American monitoring, but are not opposed to such monitoring. TID recommends a worker training program so workers could recognize resources and stop construction in the event of a discovery.

Historic Architectural Resources

No mitigation measures were recommended for historic architectural resources by TID.

STAFF'S PROPOSED MITIGATION MEASURES

Archaeological Resources

Commission staff believes that archeological monitoring should be conducted during initial grading and excavation. If no cultural resources are identified during this construction activity, the project owner would provide a letter from the Cultural Resources Specialist to the Compliance Project Manager documenting the results and recommendations for further monitoring. For archaeological resources, implementation of the conditions of certification would reduce the impacts to less than significant. Staff proposed conditions are consistent with applicant's proposed measures given the low probability of encountering buried cultural resources.

Historic Architectural Resources

Additional mitigation measures may be required for built resources in order to reduce the impacts to less than significant. Staff will request information regarding the location of the pipeline, the area of the construction easement, laydown and other ancillary areas, and the measures that might be needed to ensure that the buildings will not be impacted by the construction. If the buildings can not be avoided, additional requests to clarify the evaluation of the buildings and structures will be necessary to determine their eligibility and possible impacts.

Staff proposed conditions, based on evaluations completed by TID to date, are consistent with TID's proposed measures. TID's measures are incorporated into staff's proposed Conditions of Certification **CUL-1** through **CUL-7** presented below.

In summary, the conditions require implementation of the following measures. **CUL-1** requires that a qualified cultural resources specialist (CRS) manage cultural resources activities for the project. It also ensures that additional qualified specialists or cultural resources monitors would be retained as needed for the project. To ensure that cultural resources are adequately protected, **CUL-1** requires that the CRS have three years of experience in California. In addition to other relevant types of experience, the condition asserts that the CRS have some background in data recovery.

CUL-2 requires the project owner to provide the CRS with the necessary maps and construction schedule information to schedule monitors and cultural resources activity at the project site. The verification for the condition allows staff to verify that appropriate maps and construction schedule information have been provided to the CRS.

CUL-3 requires monitoring during initial grading and excavation. The CRS would then provide a recommendation on continued monitoring based on the observations from the initial grading and excavation. The monitoring would continue until the CRS determines that no cultural resources would be impacted and makes a recommendation for reduced monitoring to the CPM. It also requires monitoring logs and weekly summaries of the monitoring activities. All non-compliance issues have to be reported to the CPM, and a

reporting process is required. Any required Native American monitors should be obtained.

CUL-4 requires that the project owner provide a Cultural Resources Report (CRR) in Archaeological Resource Management Report (ARMR) format. This report would provide information on all field activities and the findings. The CRR would include all Department of Parks and Recreation (DPR) 523 forms and cultural resource reports not previously provided to the California Historic Resource Information System (CHRIS). Copies of the CRR would be provided to the State Historic Preservation Officer (SHPO), the CHRIS and the curating institution (if archaeological materials were collected).

CUL-5 provides for worker environmental training. The training serves to instruct workers that halting construction is necessary if a potential cultural resource is discovered. It also provides them with instruction regarding applicable laws, penalties and reporting requirements in the event something is discovered. Workers are also instructed that the CRS and other cultural resources personnel have the authority to halt construction in the event of a discovery.

CUL-6 requires notification of staff within 24 hours of a cultural resources find. Timely notification enables staff participation in determinations of significance and the selection of appropriate mitigation to lessen impacts on cultural resources to a level that is less than significant.

It is not possible to determine whether previously undiscovered cultural resources may be potentially significant. It is necessary to discover the cultural resource and assess it in relation to a research design and the criteria that would make a resource eligible to the CRHR or NRHP. In addition, **CUL-6** ensures that unanticipated impacts to cultural resources are identified.

The CRS, alternate CRS and the CRMs have the authority to halt work so that the applicant has flexibility in construction scheduling. The CRS does not have to be at all active areas of construction at the same time. In order to ensure that an impact can be mitigated to less than significant, the individual on site needs to have the ability to stop construction when a discovery is made, not at a later point in time when the CRS has been contacted and informed about the discovery. This condition has been used with these provisions for over four years and has been effective in minimizing impacts to resources.

CUL-7 requires that any collections be transferred with the CPM-approved CRR to a curation facility that meets the Secretary of Interior's Standards. It also requires the project owner to pay the curation fees.

CONCLUSIONS AND RECOMMENDATION

Impacts to cultural resources can not yet be fully determined. No known archaeological resources would be impacted by the Walnut Energy Center and there is a low potential to impact buried archaeological resources during construction. Numerous buildings and structures were identified as within the impact area of the project. Possible impacts to

the buildings and structures at 5519 Harding Road, 818 South Commons Road, and 4724 South Commons Road have not been determined.

If the following conditions of certification are properly implemented, the project would comply with applicable laws, ordinances, regulations, and standards for archaeological resources and any impacts would be reduced below a significant level. If impacts are identified to the buildings and structures at 5519 Harding Road, 818 South Commons Road, and 4724 South Commons Road, then additional mitigation measures may be required in order to reduce the impacts to less than significant and to comply with applicable laws, ordinances, regulations, and standards. Full mitigation for cultural resources can not yet be determined.

Staff recommends that the Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above. Additional measures may be necessary to mitigate impacts to cultural resources.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance, the project owner shall obtain the services of a **Cultural Resources Specialist (CRS)**, and one or more alternates, if alternates are needed, to manage all monitoring, mitigation and curation activities. The CRS may elect to obtain the services of **Cultural Resource Monitors (CRMs)** and other technical specialists, if needed, to assist in monitoring, mitigation and curation activities. The project owner shall ensure that the CRS evaluates any cultural resources that are newly discovered or that may be affected in an unanticipated manner for eligibility to the California Register of Historic Resources (CRHR). No ground disturbance shall occur prior to CPM approval of the CRS, unless specifically approved by the CPM.

CULTURAL RESOURCES SPECIALIST

The resume for the CRS and alternate(s) shall include information demonstrating that the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published in the Code of Federal Regulations, 36 CFR Part 61 are met. In addition, the CRS shall have the following qualifications:

1. The technical specialty of the CRS shall be appropriate to the needs of the project and shall include, a background in anthropology, archaeology, history, architectural history or a related field; and
2. At least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California; and

The resume of the CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS on referenced projects, and demonstrate that the CRS has the appropriate education and experience to accomplish the cultural resource tasks that must be addressed during ground disturbance, grading, construction and operation. In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that

the proposed CRS or alternate has the appropriate training and background to effectively implement the conditions of certification.

CULTURAL RESOURCES MONITOR
CRMs shall have the following qualifications:

1. a BS or BA degree in anthropology, archaeology, historic archaeology or a related field and one year experience monitoring in California; or
2. an AS or AA degree in anthropology, archaeology, historic archaeology or a related field and four years experience monitoring in California; or
3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historic archaeology or a related field and two years of monitoring experience in California.

CULTURAL RESOURCES TECHNICAL SPECIALISTS
The resume(s) of any additional technical specialists, e.g. historic archeologist, historian, architectural historian, physical anthropologist; shall be submitted to the CPM for approval.

Verification: The project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval at least 45 days prior to the start of ground disturbance.

At least 10 days prior to a termination or release of the CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval.

At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resource monitoring required by this condition. If additional CRMs are obtained during the project, the CRS shall provide additional letters to the CPM identifying the CRMs and attesting to the qualifications of the CRM, at least five days prior to the CRM beginning on-site duties. At least 10 days prior to beginning tasks, the resume(s) of any additional technical specialists shall be provided to the CPM for review and approval.

At least 10 days prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions of certification. [3/12/03]

CUL-2 Prior to the start of ground disturbance, the project owner shall provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1” = 200’) for plotting individual artifacts. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review submittals and in consultation with the CRS approve those that are appropriate for use in cultural resources planning activities.

If construction of the project would proceed in phases, maps and drawings, not previously provided, shall be submitted prior to the start of each phase. Written

notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless specifically approved by the CPM.

Verification: The project owner shall submit the subject maps and drawings at least 40 days prior to the start of ground disturbance. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

If there are changes to any project related footprint, revised maps and drawings shall be provided at least 15 days prior to start of ground disturbance for those changes.

If project construction is phased, if not previously provided, the project owner shall submit the subject maps and drawings 15 days prior to each phase.

A current schedule of anticipated project activity shall be provided to the CRS on a weekly basis during ground disturbance and also provided in each Monthly Compliance Report (MCR).

The project owner shall provide written notice of any changes to scheduling of construction phases within five days of identifying the changes. [3/12/03]

CUL- 3 1. Cultural resource monitoring shall be conducted during the initial grading and excavation at the plant site. The potential for encountering buried deposits shall be assessed by the CRS based on the initial grading and excavation observations. The initial assessment shall prescribe the type (intermittent to full time) and duration for monitoring of ground disturbance within the plant site.

2. The cultural resource monitoring shall continue until the CRS determines that no cultural resources will be impacted.

3. Monitors shall keep a daily log of any monitoring or cultural resource activities and the CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities. The CRS may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

4. The CRS shall notify the project owner and the CPM, by telephone or e-mail, of any incidents of non-compliance with any cultural resources conditions of certification within 24hours of becoming aware of the situation. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions of certification.

   Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties

assigned by the CRS or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these conditions of certification.

5. A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts are discovered. Informational lists of concerned Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that will be monitored.

Verification: Within 5 days after the initial groundbreaking and excavation, the CRS or alternate CRS will provide a letter (electronic or paper) to the CPM for approval, and to the project owner, describing the initial groundbreaking observations, including the type (intermittent to full time) and duration of cultural resources monitoring.

During the ground disturbance phases of the project, the project owner shall include in the Monthly Compliance Report (MCR) copies of the weekly summary reports prepared by the CRS regarding project-related cultural resources monitoring. Copies of daily logs shall be retained and made available for audit by the CPM as needed.

Within 24 hours of recognition of a non-compliance issue, the CRS shall notify the CPM by telephone of the problem and of steps being taken to resolve the problem. The telephone call shall be followed by an e-mail or fax detailing the non-compliance issue and the measures necessary to achieve resolution of the issue. Daily logs shall include forms detailing any instances of non-compliance with conditions of certification. In the event of a non-compliance issue, a report written no sooner than two weeks after resolution of the issue that describes the issue, resolution of the issue and the effectiveness or the resolution measures, shall be provided in the next MCR.

When Native American artifacts are found, the project owner shall send notification to the CPM identifying the person(s) retained at a minimum, an on an on-call basis to conduct Native American monitoring. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process

CUL-4 The project owner shall submit the Cultural Resources Report (CRR) to the CPM for approval. The CRR shall be written by the CRS and shall be provided in the ARMR format. The CRR shall report on all field activities including dates, times and locations, findings, samplings and analysis. All survey reports, Department of Parks and Recreation (DPR) 523 forms and additional research reports not previously submitted to the California Historic Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as an appendix to the CRR.

Verification: The project owner shall submit the subject CRR within 90 days after completion of ground disturbance (including landscaping). Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the SHPO, the CHRIS and the curating institution (if archaeological materials were collected). [3/12/03]

CUL-5 Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment. The training may be presented in the form of a video. The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. Information that the CRS, alternate CRS, and CRMs have the authority to halt construction to the degree necessary, as determined by the CRS, in the event of a discovery or unanticipated impact to a cultural resource;
4. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery, and shall contact their supervisor and the CRS or CRM; and that redirection of work would be determined by the construction supervisor and the CRS;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. An acknowledgement form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless specifically approved by the CPM.

Verification: The project owner shall provide in the Monthly Compliance Report the WEAP Certification of Completion form of persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 The project owner shall grant authority to halt construction to the CRS, alternate CRS and the CRMs in the event previously unknown cultural resource sites or materials are encountered, or if known resources may be impacted in a previously unanticipated manner (discovery). Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event cultural resources are found or impacts can be anticipated, the halting or redirection of construction shall remain in effect until all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e. work stoppage or redirection), a recommendation of eligibility and recommendations for mitigation of any cultural resources discoveries whether or not a determination of significance has been made.

2. The CRS, 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.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS and CRMs have the authority to halt construction activities in the vicinity of a cultural resource discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

CUL-7 Following the filing of the CPM-approved CRR with curation facility and the appropriate agencies described in CUL-4, the project owner shall ensure that all cultural resource materials, maps and data collected during data recovery and mitigation are delivered to the curation facility (that meets the U.S. Secretary of Interior requirements for the curation of cultural resources). The project owner shall pay any required curation fees.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty days after filing the CPM-approved CRR.

For the life of the project, the project owner shall maintain in its compliance files copies of signed contracts or agreements with the curation facility.

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HAZARDOUS MATERIALS MANAGEMENT

Geoff Lesh and Rick Tyler

INTRODUCTION

The purpose of this analysis is to determine if the proposed Walnut Energy Center (WEC) has the potential to cause 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 to 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 employees accept a higher level of risk than the general public as a condition of employment. Workers are thus not afforded the same level of protection normally provided to the public. Further, workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. Staff's **Worker Safety and Fire Protection** analysis describes the requirements applicable to the protection of workers from such risks.

The applicant has proposed to store four hazardous materials at the WEC in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j): anhydrous ammonia, sodium hydroxide, sulfuric acid, and hydrogen gas (see Table 8.12-4 of the Application for Certification [AFC]). Of these, anhydrous ammonia presents the greatest potential for off-site consequences. The use of anhydrous ammonia significantly increases the risk that would otherwise be associated with use of the safer aqueous form of ammonia. The anhydrous form, with its high internal energy, 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 much easier to contain and the slow mass transfer from the surface of the spilled material limits emissions.

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. Hazardous materials used during the construction phase include gasoline, diesel fuel, oil, welding gases, lubricants, solvents and paint. No acutely toxic hazardous materials will be used onsite during construction. None of these materials pose significant potential for off-site impacts because of their quantities on-site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project will involve the construction and operation of a natural gas pipeline and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. This pipeline will be approximately 3.6 miles in length including on and off-site segments.

The WEC will also require the transportation of anhydrous ammonia to the facility. Analysis of the potential for impact associated with such deliveries is addressed below.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws and policies 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 (Pub. L. 99-499, §301,100 Stat. 1614 [1986]), also known as SARA Title III, contains the Emergency Planning and Community Right To Know Act (EPCRA) as codified in 42 U.S.C. §11001 et seq. This Act requires that certain information about any release to the air, soil, or water of an extremely hazardous material must be reported to state and local agencies.

The Clean Air Act (CAA) of 1990 (42 U.S.C. §7401 et seq. as amended) 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 CAA section on Risk Management Plans - codified in 42 U.S.C. §112(r) - requires 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 the CAA are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

The California Accidental Release Prevention Program (Cal-ARP) - Health and Safety Code, section 25531 - 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.

Section 25503.5 of the California Health and Safety Code requires facilities, which store or use hazardous materials to prepare and file a Business Plan with the local Certified Unified Program Authority (CUPA), in this case the Stanislaus County Department of Environmental Resources. This Business Plan is required to contain information on the business activity, the owner, a hazardous materials inventory, facility maps, an Emergency Response Contingency Plan, an Employee Training Plan, and other recordkeeping forms.

Title 8, California Code of Regulations, section 5189, requires facility owners to develop and implement effective safety management plans to ensure 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."

Gas Pipeline

The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. The natural gas pipeline constructed for the WEC would be designed for Class 3 service and will meet California Public Utilities Commission General Order 112-D and 58-A standards, as well as various Pacific Gas & Electric Company (PG&E) standards. The natural gas pipeline must be constructed and operated in accordance with the Federal Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations, sections 190, 191, and 192: The pipeline classes are defined as follows (Title 49, Code of Federal Regulations, Part 192):

A Class Location Unit is an area that extends 220 yards on either side of the centerline of any continuous one-mile length of pipeline.

- Class 1: Pipelines in class location units with 10 or fewer buildings intended for human occupancy.
- Class 2: Pipelines in class location units with more than 10 but fewer than 46 buildings intended for human occupancy. This class also includes drainage ditches of public roads and railroad crossings.
- Class 3: Pipelines in class location units with more than 46 buildings intended for human occupancy, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least fivedays a week for 10 weeks in any 12 month period (the days and weeks need not be consecutive).
- Class 4: Pipelines in class location units where buildings with four or more stories above ground are prevalent.

Other Federal LORS that apply to the planned natural gas pipeline include:

- Title 49, Code of Federal Regulations, section 190, outlines the pipeline safety program procedures.

- Title 49, Code of Federal Regulations, section 191, Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety-Related Condition Reports, requires operators of pipeline systems to notify the U.S. Department of Transportation of any reportable incident by telephone and then submit a written report within 30 days.

LOCAL AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials in Articles 79 and 80. The latest revision to Article 80 was adopted in 1997 (Uniform Fire Code, 1997) and includes 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 **Seismic Issues** portion of this analysis.

If not for Energy Commission jurisdiction, the Stanislaus County Department of Environmental Resources would be the issuing agency for the Consolidated Hazardous Materials Permit. The permit review and mitigation authority covers hazardous materials, hazardous waste, compressed gases and tiered treatment, the Hazardous Materials Business Plan, and the Risk Management Plan for anhydrous ammonia. In regards to seismic safety issues, the site is located in UBC Seismic Risk Zone *3*. Construction and design of buildings and vessels storing hazardous materials must conform to the 1997 Uniform Building Code, the 1998 California Building Code, and the Stanislaus County Building Code.

SETTING

The proposed project is to be located in an industrially-zoned area about four miles west of the downtown portion of the City of Turlock, in Stanislaus County, near the intersection of West Main Street and Washington Road. The project site is level, at an elevation of approximately 85 feet above sea level. Essentially flat terrain extends for many miles on all sides of the project site. Some tall industrial structures, consistent with mixed industrial, agricultural, and residential uses including power transmission facilities, are located in the surrounding area within one mile of the project. The land uses surrounding the proposed facility consist of mixed agriculture, and low-density rural residences. Hazardous materials usage and transportation are commonly associated with the industrial/agricultural activities in the area.

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:

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to 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 (WEC 2002, AFC chapter 8.1). Staff agrees with the applicant that use of atmospheric stability class F (stagnated air, very little mixing) and one meter per second wind speed is appropriate for use in its modeling of an accidental release. Staff believes these represent a reasonably conservative scenario and thus reflects worst case atmospheric conditions.

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. With no local terrain elevated within several miles of the site, this project will not be affected by elevated terrain. Off-site concentrations of ammonia beyond the facility fenceline, however, may impact nearby receptors and potentially pose a hazard to the public.

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. In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk. Figure 8.6-1 (AFC) shows the location of the closest sensitive receptor in the project vicinity. The AFC states nearest sensitive receptor is a public child care facility (Stanislaus County Child Care) located approximately 0.9 mile east of the project.

IMPACTS AND ANALYSIS

Staff thoroughly reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals, including natural gas, were evaluated.

METHODOLOGY

In order to assess the potential for released hazardous materials to travel offsite and impact on the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that hazardous chemicals are frequently used at power plants. Therefore, staff conducted its analysis by examining the need for hazardous materials, the choice of chemical to be used and its amount, the manner in which the applicant will use the chemical, the manner it will be transported to the facility

and transferred to facility storage tanks, and the way the applicant chooses to store the material onsite.

Staff reviewed the applicant's proposed engineering controls and administrative controls concerning hazardous materials usage. Engineering controls are those physical or mechanical systems (such as storage tanks or automatic shut-off valves) which can prevent a spill of hazardous material from occurring or which can limit the spill to a small amount or confine it to a small area. Administrative controls are those rules and procedures that workers at the facility must follow that will help to prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving offsite and causing harm to people.

Staff conducted a thorough review and evaluation of the applicant's proposed use of hazardous materials as described by the applicant in the AFC (Sections 2.2.10 and 8.12). Staff's assessment followed the five steps listed below:

- Step 1: Staff reviewed the chemicals and the amounts proposed for on-site use as listed in Tables 8.12-3 and 8.12-4 of the AFC and determined the need and appropriateness of their use.
- Step 2: Those chemicals, proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings and administrative controls such as worker training and safety management programs.
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls, such as catchment basins and methods to keep vapors from spreading, and administrative controls such as training emergency response crews.
- Step 5: Staff analyzed the potential impacts to the public of a worst-case spill of hazardous materials with the mitigation measures proposed by the applicant. If the mitigation methods proposed by the applicant are found to be sufficient, no further mitigation will be recommended. If the mitigation proposed by the applicant is found to be insufficient to reduce the potential for adverse impacts to an insignificant level, staff will propose additional prevention and response controls to reduce potential impacts to an insignificant level. It is only at this point that staff can recommend that the facility be permitted to use hazardous materials.

PROJECT IMPACTS

Small Quantity Hazardous Materials

In conducting the analysis, staff determined in Steps 1 and 2 that some materials, although present at the proposed facility, pose a minimal potential for off-site impacts as they will either be stored in a solid form, in smaller quantities, or have very low toxicity. These hazardous materials were thus removed from further assessment. For example,

one such group of chemicals is the scale inhibitor chosen for use at the site. Scale inhibitors are used to control and reduce the potential for scale and corrosion to form within the pipeline system. The scale control agent listed in Table 8.12.3 of the AFC includes polyacrylate for use in the cooling tower. This chemical is safer to use than others often used at other facilities for this purpose, such as hydrazine. Staff has determined that the potential for impacts on the public are insignificant if the applicant uses these or similar scale inhibitors. See Table 8.12.3 for a list of chemicals that will be used at the power plant

During the construction phase of the project, the only hazardous materials proposed for use include paint, paint thinner, cleaners, solvents, sealants, gasoline, diesel fuel, motor oil, hydraulic fluid, welding flux and gases, lubricants and emergency refueling containers. Any impact resulting from spills or other releases of these materials will be limited to the site due to the small quantities involved. Fuels such as mineral oil, lube oil, and diesel fuel are all of very low volatility and represent a limited off-site hazard even in larger quantities (Section 8.12.4.1).

After removing from consideration those chemicals that fit into Steps 1 and 2, staff continued with Steps 4 and 5 to review the only remaining hazardous materials: sulfuric acid, hydrochloric acid, sodium hypochlorite, trisodium phosphate, petroleum fuels, natural gas, and anhydrous ammonia.

Large Quantity Hazardous Materials

Sulfuric Acid will be present in excess of the Reportable Quantity (RQ) and, therefore, must be included in the Hazardous Materials Business Plan (HMBP) and the Risk Management Plan (RMP). The amount of hydrochloric acid that will be present on site in RQ every three to five years, and at start-up, will trigger the RQ as well. During the interim periods, Hydrogen chloride (HCl) stored will be less than the RQ. These materials do not pose a risk of off-site impacts, because they have relatively low vapor pressures and thus spills would be confined to the site, or, as is the case with HCl, they will be used infrequently. Because of public concern at another proposed energy facility in 1995, staff conducted a quantitative assessment of the potential for impact associated with sulfuric acid use, storage, and transportation. Staff found no hazard would be posed to the public. However, in order to protect against risk of fire, an additional condition of certification will require the project owner to ensure that no combustible or flammable material is stored, used, or transported within 100 feet of the sulfuric acid tank. The hazard of the close proximity of tanks with regard to fire and explosive hazard should be mitigated (see Condition of Certification **HAZ-7**).

The aqueous mixture of sodium hypochlorite will likewise have a low potential to affect the off-site public because its vapor pressure is also low and the concentration of hypochlorite is low (12.5 percent). In fact, hypochlorite is used at many such facilities as a substitute for chlorine gas, which is much more toxic and much more likely to migrate off-site because it is a gas and is stored in concentrated form. Thus, the use of a water solution of sodium hypochlorite is much safer to use than the alternative, which is chlorine gas. However, accidental mixing of sodium hypochlorite with acids or anhydrous ammonia could result in toxic gases. Given the large volumes of both anhydrous ammonia (10,200 gals) and sodium hypochlorite (8000 gals) proposed for storage at this facility, the chances for accidental mixing of the two - particularly during

transfer from delivery vehicles to storage tanks - should be reduced as much as possible. Thus, measures to prevent such mixing are extremely important and will be required as an additional section within the required Safety Management Plan for delivery of anhydrous ammonia. However, staff does note that the applicant proposes to separate incompatible materials to prevent accidental mixing (AFC Section 8.6.5.3) and provide separate containment facilities for each material.

A Spill Prevention Control and Countermeasure Plan (SPCC) is required by Federal Regulations (see LORS above) and will be prepared for these petroleum-containing hazardous materials.

Natural Gas

Natural gas poses a fire and/or explosion risk as a result of its flammability. Natural gas is composed of mostly methane but also contains ethane, propane, nitrogen, butane, isobutane and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is ninety percent in concentration. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or explosions if a release were to occur. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1983), natural gas is less likely to cause explosions than many other fuel gases, such as propane or liquefied petroleum gas. While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion on-site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of effective safety management practices. In particular, gas explosions can occur in the Heat Recovery Steam Generator (HRSG) and during start-up. The National Fire Protection Association (NFPA 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. The safety management plan proposed by the applicant will address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error. Since the proposed facility will require the installation of a new gas pipeline off-site, impacts from this pipeline need to be evaluated.

The design of the natural gas pipeline is governed by laws and regulations discussed here. These LORS require use of high quality arc welding techniques by certified welders and inspection of welds. Many failures of older natural gas lines have been associated with poor quality gas welds. Many failures in older pipelines have also resulted from corrosion. Current codes address this failure mode by requiring use of corrosion resistant coatings and cathodic corrosion protection. Another major cause of pipeline failure is damage resulting from excavation activities near pipelines. Current codes address this mode of failure by requiring clear marking of the pipeline route. An additional mode of failure particularly relevant to the project area is damage caused by earthquake. Existing codes also address seismic hazard in design criteria (see discussion below). Evaluation of pipeline performance in recent earthquakes indicates that pipelines designed to modern codes perform well in seismic events while older lines

frequently fail. Staff believes that existing regulatory requirements are sufficient to reduce the risk of accidental release from the pipeline to insignificant levels.

Failures of gas pipelines, according to data from the U.S. Department of Transportation (the National Transportation Safety Board) from the period 1984 - 1991, occur as a result of pipeline corrosion, pipeline construction or materials defects, rupture by heavy equipment excavating in the area such as bulldozers and backhoes, weather effects, and earthquakes., Given the gas line failures which occurred in the Marina District of San Francisco during the 1989 Loma Prieta earthquake, the January 1994 Northridge earthquake in Southern California, the January 1995 gas pipeline failures in Kobe, Japan, as well as the January 19, 1995 gas explosion in San Francisco, the safety of the gas pipeline is of paramount importance. However, it must be noted that those pipelines that failed were older and not manufactured nor installed to modern code requirements.

The natural gas pipeline for the proposed facility will be installed, owned, and operated by the applicant. If loss of containment occurs as a result of pipe, valve, or other mechanical failure or external forces, significant quantities of compressed natural gas could be released rapidly. Such a release could result in a significant fire and/or explosion hazard, which could cause loss of life and/or significant property damage in the vicinity of the pipeline route. However, the probability of such an event is extremely low if the pipeline is constructed according to present standards.

According to DOT statistics, the frequency of reportable incidents is about 0.25 for all pipeline incidents per 1,000 miles per year or 2.5×10^{-4} incidents per mile per year (SERA 1993). DOT has also evaluated and categorized the major causes of pipeline failure. To summarize, the four major causes of accidental releases from natural gas pipelines are: outside forces-43 percent, corrosion-18 percent, construction/material defects-13 percent, and other-26 percent.

Outside forces are the primary causes of incidents. Damage from outside forces includes damage caused by use of heavy mechanical equipment near pipelines (e.g., bulldozers and backhoes used in excavation activities), weather effects, vandalism, and earthquake-caused rupture. The fourth category, “other” includes equipment component failure, compressor station failures, operator errors and sabotage. The average annual service incident frequency for natural gas transmission systems varies with age, the diameter of the pipeline, and the amount of corrosion.

Older pipelines have a significantly higher frequency of incidents. This results from the lack of corrosion protection and use of less corrosion resistant materials compared to modern pipelines, limited use of modern inspection techniques, and higher frequency of incidents involving outside forces. The increased incident rate due to outside forces is the result of the use of a larger number of smaller diameter pipelines in older systems, which are generally more easily damaged, and the uncertainty regarding the locations of older pipelines.

The applicant will provide an analysis of the likelihood (which is thought to be very low) of explosion and fire resulting from sparks generated from heavy equipment rupture of the pipeline if the DOT proposal for a pipeline risk management plan becomes

regulation. In the United States, extensive federal and state pipeline codes and safety enforcement minimize the risk of severe accidents related to natural gas pipelines. The DOT Office of Pipeline Safety is proposing new rules which include a program requiring the preparation of risk management plans for gas pipelines throughout the United States. These risk management plans must include the use of diagnostic techniques to detect internal and external corrosion or cracks in pipelines and to perform preventive maintenance. The project owner will be required to develop and implement these plans as required by the new rules when adopted by DOT. [US Department of Transportation Regulations [49 C.F.R. Part 192] (68 FR 4278; January 28, 2003)].

The applicant will provide an analysis of the likelihood (which is thought to be very low) of explosion and fire resulting from sparks generated from heavy equipment rupture of the pipeline if the DOT proposal for a pipeline risk management plan becomes regulation (**HAZ-9)**. Staff believes the worst case scenario for an off-site natural gas impact is a large rupture of the pipeline caused by improper use of heavy equipment near the pipeline. This worst case scenario would not result in a significant asphyxiation hazard since natural gas is lighter than air and disperses to the atmosphere rapidly when released. As unconfined natural gas has not been demonstrated to be detonable, staff's believes that the worst case scenario is primarily a safety hazard to construction workers from a localized fire occurring at the source of the leak. The project owner will mark the pipeline in conformance with State and Federal regulations to lower the probability the above scenario.

The following safety features will be incorporated into the design and operation of the natural gas pipeline (as required by current federal and state codes): (1) while the pipeline will be designed, constructed, and tested to carry natural gas at a certain pressure, the working pressure will be less than the design pressure; (2) butt welds will be X-rayed and the pipeline will be tested with water prior to the introduction of natural gas into the line; (3) the pipeline will be surveyed for leakage annually; (4) the pipeline will be marked to prevent rupture by heavy equipment excavating in the area; and (5) valves at the meter will be installed to isolate the line if a leak occurs. (See Conditions of Certification **HAZ-8**, & **HAZ-9**)

Anhydrous Ammonia

Based on the discussion above, anhydrous ammonia and natural gas are the only hazardous materials that may pose a risk of off-site impacts. Anhydrous 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 anhydrous ammonia without proper mitigation can result in very large down-wind concentrations of ammonia gas. One pressure vessel tank will be used to store the anhydrous ammonia with a maximum of 10,200 gallons stored in it. The use of anhydrous ammonia can result in the formation and release of a cloud in the event of a release even without interaction with other chemicals. This is a result of its relatively high vapor pressure and the large amounts of anhydrous ammonia which will be used and stored on-site. Anhydrous ammonia is a gas at ambient temperature and, therefore, is stored under pressure. The rupture of a pipe, tank, or valve would result in a gas jet of ammonia leaving the containment structure at a high rate. The resultant cooling due to rapid, adiabatic expansion will have the effect of lowering the temperature of the containment vessel. However,

pursuant to EPA and Cal-ARP guidelines, the worst-case off-site consequence analysis did not consider this effect and instead assessed a catastrophic release of the entire contents of the tank.

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 150 PPM, which is also the Risk Management Planning (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 75ppm. (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 potential exposure associated with a potential release exceeds 75ppm 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.

Staff is awaiting completion of the applicant’s final analysis of risk associated with handling of anhydrous ammonia and was, therefore, unable to provide its analysis in the PSA. Staff will provide an analysis of the risk associated with accidental release of ammonia in the Final Staff Assessment (FSA).

Transportation of Hazardous Materials

The transportation of hazardous materials to the facility can be of concern to the residents and workers in the surrounding community. Hazardous materials including ammonia, sulfuric acid, and sodium hypochlorite will be transported to the facility via tanker truck. While many types of hazardous materials will be transported to the site, it is staff’s belief that transport of ammonia would pose the predominance of risk associated with such transport. In addition to ammonia posing the highest transportation risk, aqueous ammonia while less hazardous than anhydrous ammonia requires roughly three times as many deliveries as the anhydrous form. As a result, the relative transportation risks associated with aqueous and anhydrous ammonia use is a significant consideration in selection of the type of ammonia to be used.

Staff believes that it is appropriate to rely on the extensive regulatory program that applies to shipment of hazardous materials on California Highways to ensure safe handling in general transportation (see the Federal Hazardous Materials Transportation Law [49 U.S.C. §5101 et seq], the US Department of Transportation Regulations [49 C.F.R. Subpart H, §172-700], and California DMV Regulations on Hazardous Cargo). These regulations also address the issue of driver competence.

To address the issue of tanker truck safety, the Applicant stated that anhydrous ammonia would be delivered to the proposed facility only in certified vehicles with a design capacity of 7,500 gallons. These vehicles will be designed to DOT Code MC-330 or MC-331. These are high integrity vehicles designed for hauling caustic materials

under pressure such as anhydrous ammonia. Staff has proposed a Condition of Certification (**HAZ-6**) to ensure that regardless of which vendor supplies the ammonia, delivery will be made in a tanker truck, which meets or exceeds the specifications described by these regulations.

It is noteworthy that the transportation of similar volumes of hazardous materials on the nation's highways is not unique nor an infrequent occurrence. Based on the environmental mobility, toxicity, quantities present at the site, and frequency of delivery, it is staff's opinion that ammonia poses the predominate risk associated with hazardous materials transportation and use at the proposed facility. Based on this, staff concludes that the risk associated with transportation of other hazardous materials to the proposed facility does not significantly increase the risk of impact beyond that associated with transporting ammonia.

Seismic Issues

The possibility exists that an earthquake could cause the failure of a hazardous materials storage tank and rupture of the natural gas pipeline. The quake could also cause the failure of the secondary containment system (berms and dikes) as well as electrically controlled valves, pumps, neutralization systems and the foam vapor suppression system. The failure of all these preventive control measures might then result in a vapor cloud of hazardous materials moving off-site and impacting the residents and workers in the surrounding community. The effects of the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan heighten the concern regarding earthquake safety

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large storage tanks and smaller tanks associated with the water treatment system of a cogeneration facility. Those tanks with the greatest damage - including seam leakage - were older tanks while the newer tanks sustained displacements and failures of attached lines. Therefore, staff conducted an analysis of the codes and standards, which should be followed in adequately designing and building storage tanks and containment areas as well as the natural gas pipeline in order to withstand a large earthquake. Staff notes that the proposed facility will be designed and constructed to the applicable standards of the Uniform Building Code for Seismic Zone 3, CPUC General Order 112E, and Title 49, California Code of Regulations, section 192. Thus, compliance with applicable regulations will ensure protection from earthquake damage.

CUMULATIVE IMPACTS

Staff reviewed the potential for the operation of the WEC combined with the existing facility of Super Store Industries Turlock Dairy Division at 2600 Spengler Way in Turlock, which is located approximately 0.5 miles from proposed project site, to result in cumulative impacts on the population within the area. Projects that could potentially contribute to cumulative impacts are those located in the same geographic area of influence defined as within a 5-mile radius of the proposed power plant. Other facilities in the area of the project site store ammonia that could potentially migrate and make a minor contribution to a cumulative release. Such facilities include Turlock Cold Storage at 107 South Kilroy Road, Turlock, located 0.6 miles from the proposed site. In addition,

the Foster Turkey Products Plant 1 at 545 C Street in Turlock is located approximately 2.8 miles from the proposed project site. A simultaneous release from WEC and one of these facilities could cause cumulative impacts, if the migrating clouds merged. The probability of a simultaneous large-scale release from more than one facility, at a time when the weather conditions were just right for the plumes to combine, and then to move over a populated area without significant dispersal, is not considered to be significant. Staff therefore concludes that the proposed facility, with mitigating measures proposed, will result in no significant cumulative impacts.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed WEC power plant (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff considers these to be pockets or clusters. Staff also reviewed Census 2000 information that shows the low-income population is less than fifty percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for **Hazardous Materials Management**.

Based on the **Hazardous Materials Management** analysis staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no **Hazardous Materials Management** environmental justice issues related to this project.

APPLICANT'S PROPOSED MITIGATION

The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a safety management program, which includes the use of both engineering and administrative controls. Administrative controls include the development and implementation of a Safety Management Plan. Elements of facility controls and the safety management plan are summarized below.

ENGINEERING CONTROLS

Engineering controls help to prevent accidents and releases (spills) from moving off-site and impacting the community by incorporating engineering safety design criteria into the design of the facility. The engineered safety features proposed by the applicant for use at this facility include:

- construction of dikes, berms, and/or catchment basins in the hazardous materials storage areas to contain accidental releases that might happen during storage or delivery;
- physical separation of stored chemicals in separate containment areas in order to prevent accidental mixing of incompatible materials which may result in the evolution and release of toxic gases or fumes;

- a secondary containment structure surrounding the ammonia storage tanks;
- secondary containment areas surrounding other large quantity chemical tanks; and
- a sloped containment pad that will drain into a sump placed beneath the tanker truck ammonia delivering area; and sumps will be provided for each of the secondary diked areas around each large chemical storage tank.

ADMINISTRATIVE CONTROLS

Administrative controls also help to prevent accidents and releases (spills) from moving off-site and impacting the community by establishing worker training programs, process safety management programs and by complying with all applicable health and safety laws, ordinances and standards.

The worker health and safety program proposed by the applicant for use at this facility will include (but is not limited to) the following elements:

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- the proper use of personal protective equipment;
- safety procedures for operation and maintenance of systems utilizing hazardous materials; and
- fire safety and prevention and emergency response actions including facility evacuation, and hazardous material spill cleanup.

At the facility, the project owner will be required to designate an individual who has the responsibility and authority to ensure a safe and healthful workplace. The project health and safety professional oversees the health and safety program and has the authority to halt any action or modify any work practice in order to protect the workers, facility, and the surrounding community or in the event that the health and safety program is violated.

A facility Process Safety Management Program is required for the facility. This is a program for the regular inspection and maintenance of equipment, valves, piping, and appurtenances. Additionally, the process safety management program requires that only trained facility personnel are assigned to the transfer and handling of hazardous chemicals.

In order to address the issue of spill response, the facility will prepare and implement an Emergency Response Plan which includes information on: hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities, etc. Emergency procedures will be established which include evacuation; spill cleanup, hazard prevention, and emergency response.

STAFF'S PROPOSED MITIGATION

Staff is awaiting the applicant's analysis of risk associated with use of anhydrous ammonia and has, therefore, not completed its analysis of risks associated with use of anhydrous ammonia. Staff will propose any necessary mitigation for use of anhydrous ammonia in the FSA.

FACILITY CLOSURE

The requirements for the 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, Stanislaus County Environmental Health Department, 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).

CONCLUSIONS AND RECOMMENDATIONS

Staff is currently awaiting the applicant's analysis of potential risk associated with anhydrous ammonia and has not yet completed its analysis. Staff will provide its conclusions and recommendations in the FSA.

PROPOSED CONDITIONS OF CERTIFICATION

Staff is awaiting the applicant's analysis of risk associated with use of anhydrous ammonia and will propose additional conditions of certification regarding its use in the FSA.

HAZ-1 The project owner shall not use any hazardous material not listed in Appendix C, below, or in greater quantities than those identified by chemical name in Appendix C, below, unless approved in advance by the CPM.

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

HAZ-2 The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) to the Certified Unified Program Authority – (CUPA) (Stanislaus County)) and the CPM for review at the time the RMP is first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall reflect all recommendations of the CUPA and the CPM in the final documents. Copies of the final Business Plan and RMP, reflecting all comments, shall be provided to the CPM.

Verification: At least 60 days prior to receiving any hazardous material on the site, the project owner shall provide a copy of a final Business Plan to the CPM. At least 60 days prior to delivery of ammonia to the site, the project owner shall provide the final EPA-approved RMP, to the CUPA and the CPM.

HAZ-3 The ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, a secondary containment basin capable of holding 125 percent of the storage volume shall protect the storage tank plus the volume associated with 24 hours of rain assuming the 25-year storm as specified in the AFC.

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

HAZ-4 The project owner shall ensure that no combustible or flammable material is stored, used, or transported within 100 feet of the sulfuric acid tank.

Verification: At least sixty (60) days prior to receipt of sulfuric acid on-site, the Project Owner shall provide copies of the facility design drawings showing the location of the sulfuric acid storage tank and the location of any tanks, drums, or piping containing any combustible or flammable material and the route by which such materials will be transported through the facility.

HAZ-5 The natural gas pipeline shall be designed to meet CPUC General Order 112-D and E and 58 A standards, or any successor standards, and shall be designed to meet Class III service. The pipeline shall be designed to withstand seismic stresses and shall be leak surveyed annually for leakage. The project owner shall incorporate the following safety features into the design and operation of the natural gas pipeline: (1) the pipeline shall be designed and constructed to carry natural gas at a pressure of 1000 psig, (2) butt welds shall be x-rayed and the pipeline shall be pressure tested prior to the introduction of natural gas into the line; (3) the pipeline shall be surveyed for leakage annually according to the operations and maintenance plan to be provided by the applicant (AFC section 6.5); (4) the pipeline shall be marked to prevent rupture by heavy equipment excavating in the area; and (5) valves shall be installed to isolate the line if a leak occurs.

Verification: Prior to the introduction of natural gas into the pipeline, the project owner shall submit design, operation, testing, and route marking specifications to the CPM for review and approval.

HAZ-6 The project owner shall provide a risk assessment as proposed by the Office of Pipeline Safety, DOT if the proposed program becomes regulation.

Verification: Prior to the introduction of natural gas into the pipeline, the project owner shall submit design and operation specifications to the CPM for review and approval.

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APPENDIX A

Hazardous Material Management

Basis For Staff's Use Of 75 Ppm Ammonia Exposure Criteria

Staff uses a health-based airborne concentration of 75 PPM to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this level is not consistent with the 200-ppm level used by EPA and Cal/EPA in evaluating such releases pursuant the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's CEQA analysis. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices and actions are implemented 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 for the entire population. 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 Limit (STPEL) for ammonia to determine the potential for significant impact. This limit is designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at this level should not result in serious effects 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 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. Appendix B provides a summary of adverse effects, which might be expected to occur at various airborne concentrations of ammonia

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 protects 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 FOR APPENDIX A, TABLE 1

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ABBREVIATIONS FOR APPENDIX A, TABLE 1

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

APPENDIX B

SUMMARY OF ADVERSE HEALTH EFFECTS OF AMMONIA

638 PPM

WITHIN SECONDS:

- Significant adverse health effects;
- Might interfere with capability to self rescue;
- Reversible effects such as severe eye, nose and throat irritation.

AFTER 30 MINUTES:

- Persistent nose and throat irritation even after exposure stopped;
- irreversible or long-lasting effects possible: lung injury;
- Sensitive people such as the elderly, infants, and those with breathing problems (asthma) experience difficulty in breathing;
- asthmatics will experience a worsening of their condition and a decrease in breathing ability, which might impair their ability to move out of area.

266 PPM

WITHIN SECONDS:

- Adverse health effects;
- Very strong odor of ammonia;
- Reversible moderate eye, nose and throat irritation.

AFTER 30 MINUTES:

- Some decrease in breathing ability but doubtful that any effect would persist after exposure stopped;
- Sensitive persons: experience difficulty in breathing;
- asthmatics: may have a worsening condition and decreased breathing ability, which might impair their ability to move out of the area.

64 PPM

WITHIN SECONDS:

- Most people would notice a strong odor;
- Tearing of the eyes would occur;
- Odor would be very noticeable and uncomfortable.
- Sensitive people could experience more irritation but it would be unlikely that breathing would be impaired to the point of interfering with capability of self rescue
- Mild eye, nose, or throat irritation
- Eye, ear, & throat irritation in sensitive people
- asthmatics might have breathing difficulties but would not impair capability of self rescue

22 or 27 PPM

WITHIN SECONDS:

- Most people would notice an odor;
- No tearing of the eyes would occur;
- Odor might be uncomfortable for some;
- sensitive people may experience some irritation but ability to leave area would not be impaired;
- Slight irritation after 10 minutes in some people.

4.0, 2.2, or 1.6 PPM

- No adverse effects would be expected to occur;
- doubtful that anyone would notice any ammonia (odor threshold 5 - 20 PPM);
- Some people might experience irritation after 1 hr.

APPENDIX C

TID, Walnut Energy Center Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite
Acutely Hazardous Materials			
Anhydrous Ammonia	Anhydrous Ammonia	7664-41-7 (NH_3)	10,200 gal.
Neutralizing Amines (e.g., NALCO 356)	Cyclohexylamine (20 to 40%)	108-91-8	400 gal.
	Morpholine (5 to 10%)	110-91-8	
Sulfuric Acid	Sulfuric Acid (93%)	7664-93-9	8,000 gal.
Hazardous Materials			
Ammonium Bifluoride	Ammonium Bifluoride	1341-49-7	200 lbs. initially and once every 3 to 5 years
Anti-Foam (e.g., NALCO 71 D5 ANTIFOAM)	Hydrotreated light distillate (10-20%)	6742-47-8	400 gal.
	n-Decanol (1-5%)	112-30-1	
	n-Octanol (5-10%)	118-87-5	
Antifreeze	Propylene Glycol	57-55-6	55 gal.
Calcium Sulfate	Calcium Sulfate	10101-41-4	4,000 lbs.
Chelating Agents	Ethylenediaminetetra-acetic acid (EDTA)	60-00-4	55 gal.
Citric Acid	Citric Acid	77-92-9	100 lb.
Cleaning Chemicals/Detergents	Various	None	100 gal.
Diesel No. 2	Oil	None	500 gal.

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite
Formic Acid	Formic Acid	64-18-6	600 lb. prior to startup; 100 gal. on a regular basis
Hydraulic Oil	Oil	None	500 gal.
Hydrochloric Acid	Hydrochloric Acid (30%)	7647-01-0	10,000 lb. initially and once every 3 to 5 years; 55 gal. on a regular basis
Hydroxyacetic Acid	Gyrolic Acid	None	1000 lb. prior to startup; 100 gal. on a regular basis
Laboratory Reagents (liquid)	Various	None	10 gal.
Laboratory Reagents (solid)	Various	None	100 lb.
Lubrication Oil	Oil	None	15,000 gal.
Mineral Insulating Oil	Oil	8012-95-1	70,000 gal.
Non-Oxidizing Biocide (e.g., NALCO 7330)	5-Chloro-2-Methyl-4-Isothiazolin-3-one (1.1%)	26172-55-4	200 gal.
	2-Methyl-4-Isothiazolin-3-one (0.3%)	2682-20-4	
Oxygen Scavenger (e.g., NALCO ELIMIN-OX)	Carbohydrazide	497-18-7	400 gal.
Scale Inhibitors (various)	Polyacrylate	Various	1,500 gal.
Sodium Bromide	Sodium Bromide	7647-15-6	6,000 gal.

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite
Sodium Carbonate (Soda Ash)	Sodium Carbonate	497-19-8	1,000 lb. Initially and once every 3 to 5 years
Sodium Hypochlorite (Bleach)	Sodium Hypochlorite (12.5%)	7681-52-9	8,000 gal.
Sodium Nitrate	Sodium Nitrate	7631-99-4	500 lb. initially and once every 3 to 5 years
Sodium Nitrite	Sodium Nitrite	7632-00-0	500 lb. initially and once every 3 to 5 years
Sodium Sulfate	Sodium Sulfate	7757-82-6	4,000 lb.
Stabilized Bromine (NALCO STABREX ST70)	Sodium Hydroxide (1 to 5%) Sodium Hypobromite (10 to 50%)	1310-73-2 13824-96-9	2,000 gal.
Sulfur Hexafluoride	Sulfur Hexafluoride	2551-62-4	200 lb.
Trisodium Phosphate	Sodium Phosphate, Tribasic	7601-54-9	400 gal.

LAND USE

David Flores

INTRODUCTION

This land use analysis of the Walnut Energy Center (WEC) focuses on two main issues: the project's consistency with local land use plans, ordinances and policies; and the project's compatibility with existing and planned land uses. In general, an electric generation project and its related facilities may be incompatible with existing and planned land uses if it creates unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it unduly restricts existing or planned future uses.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

This section describes federal, state, regional, and local land use LORS applicable to the proposed project.

FEDERAL

No federal LORS for land use apply to the proposed project.

LOCAL

City of Turlock

City of Turlock Zoning Ordinance

The City of Turlock Zoning Ordinance (Article 9 of the City of Turlock General Code) establishes land use (zone) districts in the unincorporated area. In each specific land use district, the types of development, dimensions for buildings, and open spaces are regulated for the purpose of implementing the general plan of the county. The purposes of these regulations are protecting existing development, encouraging beneficial new development, and preventing overcrowding and congestion. **LAND USE Figure 1** shows the zoning districts in the area of the proposed project site.

City of Turlock General Plan

Under California State planning law, each incorporated City and County must adopt a comprehensive, long-term General Plan that governs the physical development of all lands under its jurisdiction. The general plan is a broadly scoped planning document and defines large-scale planned development patterns over a relatively long timeframe.

The General Plan consists of a statement of development policies and must include a diagram and text setting forth the objectives, principles, standards and proposals of the document. At a minimum, a General Plan has seven mandatory elements including Land Use; Circulation; Housing; Conservation; Open Space; Noise and Safety.

The City of Turlock administers the State required general plan as a group of documents organized by geographic areas and subject matter and has included a Land Use element in its Plan (Government Code, § 65301 & § 65303). **LAND USE Figure 2** shows the general plan designations in the area of the proposed project site.

Land Use Element

The Land Use Element addresses the types and locations of land uses (e.g., residential, industrial, commercial, infrastructure such as roads, wastewater treatment, and utility facilities) that the City Council considers appropriate for the long-range outlook of the General Plan.

Stanislaus County

Stanislaus County General Plan

Land Use Element

Policy 17: Promote diversification and growth of the local economy.

Implementation Measure 1: Encourage Stanislaus County Economic Development Corporation to promote Stanislaus County as a profitable location for industry.

Implementation Measure 4: Encourage the development of new industries and retention of existing industries that help the community reduce, recycle, and/or reuse waste that would otherwise require disposal.

Policy 20: Facilitate retention and expansion of existing businesses.

Goal 4: Ensure that an effective level of public service is provided in unincorporated areas.

SETTING

SITE AND VICINITY DESCRIPTION

The proposed Walnut Energy Center (WEC) is to be built on an 18-acre portion of an approximately 69-acre parcel located in the southwestern portion of the City near the intersection of West Main and Washington Road. A 20-foot irrigation easement exists on the eastern boundary of the parcel, a 12.5 foot irrigation easement on the southwestern boundary of the property and a 20-foot electrical easement on the northwesterly boundary of the property.

LAND USE Figure 1
Zoning Map

LAND USE Figure 2
General Map Land Use Map

The parcel is currently being used for agricultural crops, which are typically corn and oats used for livestock feeding in the area. The Union Pacific Railroad Line exists just north of the project site. Highway 99 is approximately two miles east of the site and the Turlock Irrigation District peaking plant and substation is west of the property.

SURROUNDING LAND USE

Land uses surrounding the site include large parcel agriculture, open space and industrial uses. Specific surrounding uses are described as follows:

- North: Immediately north of the project site is the Union Pacific Railroad line. Beyond the railroad line is a Foster Farms grains facility and accompanying silos.
- South: Agricultural land with a communication tower southeast of the project site.
- East: Immediately east are agricultural lands, and beyond are various farming headquarters and dairies.
- West: Agricultural land and beyond is Washington Road.

Other uses in the vicinity of the site include scattered residential homesites, agriculturally related facilities and a small peaker power plant fueled by natural gas.

Irrigated agricultural lands exist along the project's 69-kV and 115-kV electric transmission line routes from the project site to the existing Walnut Hilmar 115-kV and the Walnut-Industrial 69-kV transmission lines.

The water supply lines and natural gas line for the project would cross irrigated agricultural land, and developed industrial areas.

PROJECT FEATURES

GENERATING FACILITY

The WEC project-generating facility would consist of a 250 MW natural gas fired combined cycle generating facility. Approximately 18-acres of land will be required to accommodate the plant facilities, which are comprised of:

- turbine/generator area;
- two heat recovery steam generators;
- one condensing steam turbine generator;
- deaerating surface condenser;
- mechanical draft cooling tower;
- parking area; and
- transmission switchyard.

There is a proposed access road for fire equipment and facility maintenance on the plant site.

115-KV TRANSMISSION LINE INTERCONNECTION

The linear facilities for the project would include a new 1,950 feet double-circuit 115-kV transmission line that would run along the west side of South Washington Road and tie into the existing Hilmar-Walnut 115-kV line just west of Washington Road and just south of the Union Pacific Railroad tracks. Existing land uses within 0.5 miles of the 115-kV interconnection include agricultural production, agriculturally related industries, and scattered residential.

69-KV TRANSMISSION LINE INTERCONNECTION

The WEC project will also require a new 670-foot double-circuit 69-kV transmission line. The 69-kV transmission line route runs along the south property line of the project parcel and Ruble Road. This interconnection will tie into the existing Walnut Industrial 69-kV Line 2 approximately 2,600 feet north of Linwood Avenue.

Existing land uses within 0.5 miles of the transmission route include agricultural crops, scattered residential, agricultural related businesses and a telecommunication site.

Recycled Water pipeline

An approximate 1.6-mile buried 12 to 24-inch recycled water supply pipeline would leave the WEC project site and head approximately 1,000 feet south to Ruble Road along the east side of the 69-acre parcel. It will then continue east on Ruble Road for approximately 3,350 feet to South Tegner Road. At South Tegner Road, the pipeline will proceed south approximately 1,100 feet to an existing 69-kV Turlock Irrigation District transmission line corridor. The pipeline will then turn east, paralleling the transmission line, for approximately 2,600 feet until it reaches South Kilroy Road. At South Kilroy Road, the pipeline will head south for approximately 350 feet, where it will head due east into the City's wastewater treatment plant site. Existing land uses within 0.5 miles of the proposed recycled water line include agricultural crops, scattered residential and agriculturally related businesses.

Potable Water Pipeline

An approximate 0.9-mile buried 8 to 14-inch potable water line will leave the WEC plant site and head south to Ruble Road approximately 1,100 feet along the east side of the 69-acre parcel. It will then continue east on Ruble Road for approximately 3,350 feet to South Tegner Road. At South Tegner Road, it will interconnect with the City's existing potable water main line. Existing land uses within 0.5 miles of the proposed potable water line include agricultural crops, scattered residential and agriculturally related businesses.

IMPACTS

According to Appendix G of the Guidelines to the California Environmental Quality Act (CEQA), a project may have a significant effect on land use if a proposed project would:

- convert Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural use (Section II, Agricultural Resources);

- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect (Section IX, Land Use and Planning); or
- disrupt or divide the physical arrangement of an established community (Section IX, Land Use and Planning).

A project may also have a significant impact on land use if it would create unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or if it precludes or unduly restricts existing or planned future uses.

CONFORMITY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code § 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the [Energy] commission determines that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. In making the determination, the commission shall consider the entire record of the proceeding including, but not limited to, the impacts of the facility on the environment, consumer benefits, and electric system reliability." In no event shall the commission make any finding in conflict with applicable federal law or regulation. When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with applicable agencies to determine conformity and, when necessary, "to attempt to correct or eliminate any noncompliance" (§ 25523(d)(1)). The laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below to determine the extent to which the WEC is consistent or a variance with each requirement or standard.

Project Site

California Land Conservation Act of 1965

The 69-acre parcel containing the project site does not have a land conservation contract. Also, the property is not within a Williamson Act preserve or a Farmland Security Zone. The project's proposed linear facilities do not cross Williamson Act preserve lands or a Farmland Security Zone.

City of Turlock General Plan/Land Use LORS and Policies

Land Use Element

The General Plan was amended in 2002. It reflects the values and contains the goals of the community regarding development. The General Plan policies express the abstract ideas and visions of the community, and were designed to create an economic and social balance consistent with Turlock's growth. The following General Plan Land Use policies applicable to the WEC project are listed below:

- Industrial **Standards:** Section 2.5-h: Industrial developments shall be designed to minimize potential community impacts adversely affecting residential and commercial areas in relation to local and regional air quality and odor, adequacy of municipal service, local traffic conditions, visual quality, and noise levels.

  Section 2.5-I: Buffer industrial and heavy commercial areas from adjacent residential, commercial, and recreation areas.

  Section 2.5-j: Designate industrial areas to be solely utilized by industrial uses to maintain and encourage mutually supportive, attractive, and compact industrial environments and to be protected from encroachment or preemption by other incompatible uses.

- **Urban Reserve Standards:** Section 2.10: The General Plan states that lands currently in agricultural production can be converted to urban uses if urban services can be provided and population growth justifies conversion of land use; contingent on additional analysis, planning and action by the City as appropriate. Agricultural uses are permitted, but are considered transitional and are intended to eventually be replaced by urban development.

The proposed project with its industrial/utility infrastructure land use, is consistent with the Turlock General Plan, including its Industrial and Urban Reserve Standards.

City of Turlock Zoning Ordinance

The proposed project site is within an “I” (Industrial Zone) District (City of Turlock, 2002). In 1992, the City of Turlock annexed approximately 4,700 acres of agricultural land, and rezoned this large area which includes the project site, from Agricultural to Industrial.

Uses such as the WEC are permitted and generally encouraged in Turlock's "I" Districts. Industrial districts or "I" districts are established to minimize the impact of industrial uses on adjacent residential and commercial districts, and to provide for the full range of manufacturing, industrial processing, general service, and distribution uses deemed suitable for location in Turlock; and to protect Turlock's general industrial areas from the competition for space from unrelated uses that could more appropriately be located elsewhere in the city. (City Zoning Ordinance, Title 9-3-401). To ensure that the WEC conforms to the City of Turlock Zoning Code, staff recommends that the Commission require the following Conditions of Certification:

- **LAND-1** requiring compliance with the design and performance standards for the "I" Zoning District;
- **LAND-2** requiring compliance with the City’s parking standards;
- **LAND-3** requiring compliance with the City’s outdoor advertising regulations applicable to any WEC signs erected (either temporary or permanent);
- **LAND-4** requiring the City’s review and comment on descriptions of the final laydown/staging areas identified for construction of the WEC; and
- **LAND-5** requiring compliance with the City’s requirements for minimum setbacks from the property line.

Linear Facilities

City of Turlock/Stanislaus County General Plan and Zoning Ordinance

Most of the City's General Plan and zoning land use designations along the 115-kV and 69-kV transmission routes are industrial and the area is intended for future development for this purpose. The WEC's linear facilities would be consistent with these designations. The County's zoning and general plan designations along the two WEC transmission line routes are generally agricultural. Transmission lines are permitted uses in this zone, and all other zones in the County's jurisdiction.

COMPATIBILITY WITH EXISTING AND PLANNED LAND USES

Project Site

The project would be constructed on an 18-acre portion of a 69-acre industrially designated parcel owned by the applicant.

Of the various zoning districts in the City's Zoning Ordinance, the Industrial "I" zoning district in which the project site is located, is the most appropriate zoning district for a power plant, which is intended to provide for public utility facilities. Power plants are specifically listed as a compatible use in the "I" District. The project complies with all of the applicable development standards (lot, and yard requirements) set forth in the Zoning Ordinance for the "I" District. Staff is currently working with the City of Turlock Planning Department in obtaining additional conditions of certification to insure compliance with their local LORS. Any additional condition requirements will be reflected in the Final Staff Assessment.

Existing land uses in the vicinity of the site consist of large acreage agricultural lands and agricultural related operations, and an existing peaker power plant facility. Scattered residences in the area could be affected by air quality impacts and the visual impacts of the potential plume from the proposed facility. Travelers on State Highway 99, approximately five miles from the project site, and Washington Road users could be similarly affected by visual impacts of the facility. These impacts are addressed in greater detail in the **AIR QUALITY** and **VISUAL RESOURCES** Sections of the PSA.

Staff believes that the project's consistency with: 1) the City's land use designation and zoning for the site; and 2) the current development pattern for the area established by the City of Turlock is consistent with the General Plan and zoning ordinance, and that the WEC is an allowed and compatible use for the area. Staff believes that the proposed power plant development will be compatible with the surrounding agricultural and industrial operations. Staff believes that the existing peaker power plant facility in the vicinity is compatible with surrounding uses, and WEC will be similar (See **Figure 2** for location of Peaker Plant).

Conversion of Prime Farmland

The project's construction would result in the physical conversion of 18-acres of land considered "Prime Farmland" by the California Department of Conservation. Although the City of Turlock considers the land to be industrial given its 1992 rezoning, CEQA

dictates that the Commission staff considers the current physical state of the site. Staff considers the loss and conversion of productive agricultural land to be a potentially significant impact under CEQA. In order to help offset the project-related impacts from the loss of prime agricultural land, **LAND- 6** requires that the applicant, in coordination with the City of Turlock: 1) mitigate for this impact by contributing funds to the City of Turlock or Stanislaus County for a 1:1 purchase of prime agricultural land for permanent farming use and/or easement purchases; or 2) contribute funds to a local or statewide agricultural land trust. Staff believes that, with the implementation of **Condition of Certification LAND- 6,** the WEC is compatible with existing and planned land uses in this area of Turlock, and impacts would be less than significant.

Linear Facilities

Disruption or Division of an Established Community

The water supply/gas pipeline and transmission line alignments would temporarily affect land currently being used in agricultural production. The topsoil in these areas would be removed during the construction period, and temporarily converted to non-agricultural use by this project. Soil surface would be returned to the original grades and agricultural use upon completion of construction activities. Therefore, no existing farmlands would be permanently converted to non-agricultural use for the WEC's linear facilities. The impacts would be less than significant.

As discussed earlier in this report, both the 69 kV and 115 kV proposed transmission line routes would be installed within existing dedicated right-of-ways. They would not affect adjacent farmland activities.

CUMULATIVE IMPACTS

The proposed project is consistent with the City of Turlock's (City) long-range land use policies for this industrially-designated area as expressed in the General Plan. Conformance with the General Plan is the primary consideration in determining a project’s potential to contribute to adverse cumulative land use impacts. Therefore, projects that are consistent with the City’s long-range land use policies are not viewed as adverse from a cumulative impact perspective. The General Plan sets forth the City's long-range vision for the physical development of the incorporated areas, and other plans for infrastructure and public services are based on this long-range vision.

The General Plan envisions the eventual conversion of agricultural land and continuation of industrial development in the site vicinity. At this time, there are no other project proposals in the vicinity of the WEC project. The project is consistent with the City's long-range planning policies for development of a power plant in this area, therefore cumulative land use impacts are not considered significant. Although the project will contribute to the cumulative loss of agricultural land in the City, staff has recommended that the applicant mitigate for the impact of conversion of prime farmland.

The proposed project is not expected to make a significant contribution to regional impacts related to new development and growth, such as population inmigration, the

resultant increased demand for public services, and expansion of public infrastructure such as water pipelines to serve residential development.

ENVIRONMENTAL JUSTICE

Staff has reviewed the Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed Walnut Energy Center (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff considers these to be pockets or clusters. Staff also reviewed Census 2000 information that shows the low-income population is less than 50 percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff conducted a focused environmental justice analysis with respect to land use.

Based on staff's land use analysis, which included consideration of information provided by participants at workshops, staff has not identified any unmitigated, significant direct or cumulative impacts resulting from construction or operation of the project, meaning that there would be no land use related environmental justice issues for this project.

FACILITY CLOSURE

At some point in the future, the proposed facility would cease operation and close down. At that time, it would be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The planned lifetime of the WEC plant is estimated at thirty years. At least twelve months prior to the initiation of decommissioning, the Applicant would prepare a Facility Closure Plan for Energy Commission review and approval. This review and approval process would be public and allow participation by interested parties and other regulatory agencies. At the time of closure, all applicable LORS would be identified and the closure plan would discuss conformance of decommissioning, restoration, and remediation activities with these LORS. All of these activities would fall under the authority of the Energy Commission.

There are at least two other circumstances under which a facility closure can occur, unexpected temporary closure and unexpected permanent closure. Staff has not identified any LORS from a land use perspective that the applicant would have to comply with in the event of unexpected temporary closure or unexpected permanent closure of the WEC.

CONCLUSIONS

1. Staff believes that the project's consistency with: 1) the City's land use designation and zoning for the site is a consistent and allowed use.
2. Staff's expectation is that it will reach a mitigation agreement with the applicant regarding the conversion and loss of productive agricultural land, which is a

potentially significant impact. After reviewing the current land use and soil maps of the project site, Staff has concluded that in order to reduce the potentially significant impact to a level of insignificance under CEQA, the applicant must comply with **Condition of Certification LAND-6** in providing a mitigation fee for the loss of prime agricultural land.

3. The project would not disrupt or divide the physical arrangement of an established community. The downtown area of Turlock is approximately three miles away from the subject property.
4. The project would not preclude or unduly restrict existing or planned land uses. The project would not preclude or unduly restrict the conducting of agricultural land uses on neighboring properties.
5. With mitigation, operation of the project would not cause any significant noise, dust, public health, traffic, or visual impacts to nearby land uses, nor would the operation of the WEC contribute substantially to any cumulative land use impacts.

If the project is certified, staff recommends that the Commission adopt the following proposed Conditions of Certification.

PROPOSED CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall comply with the minimum design and performance standards for the Industrial ("I") Zoning District set forth in the City of Turlock Zoning Ordinance.

Verification: At least 30 days prior to the start of construction, the project owner shall submit written documentation, including evidence of review by the City of Turlock Planning Department that the project meets the above referenced requirements and has been reviewed by the City.

LAND-2 The project owner shall comply with the parking standards established by the City of Turlock Zoning Ordinance (Chapter 9-2, Article 2).

Verification: At least 30 days prior to start of construction, the project owner shall submit to the CPM, written documentation, including evidence of review by the City of Turlock, that the project conforms to all applicable parking standards.

LAND-3 The project owner shall ensure that any signs erected (either permanent or for construction only) comply with the outdoor advertising regulations established by the City of Turlock Zoning Ordinance (Chapter 9-2, Article 5).

Verification: At least 30 days prior to start of construction, the project owner shall submit to the CPM, written documentation, including evidence of review by the City of Turlock, that all erected signs will conform to the zoning ordinance.

LAND-4 The project owner shall provide the Director of the City of Turlock Planning Department for review and comment and the CPM for review and approval, descriptions of the final lay down/staging areas identified for construction of the project. The description shall include:

(a) Assessor's Parcel numbers;

(b) addresses;

(c) land use designations;

(d) zoning;

(e) site plan showing dimensions;

(f) owner's name and address (if leased); and

(g) duration of lease (if leased); and, if a discretionary permit was required; (2) copies of all discretionary and/or administrative permits necessary for site use as lay down/staging areas.

Verification: The project owner shall provide the specified documents at least 30 days prior to the start of any ground disturbance activities.

LAND-5 The project owner shall provide to the CPM for approval, a site plan with dimensions showing the locations of the proposed buildings and structures in compliance with the minimum yard area requirements (setbacks) from the property line as stipulated in the City of Turlock Zoning Ordinance.

Verification: Thirty (30) days prior to the start of construction, the project owner shall submit a site plan showing that the project conforms to all applicable yard area requirements as set forth in the City of Turlock Zoning Ordinance.

LAND-6 The project owner shall mitigate at a one to one ratio for the conversion of 18 acres of prime farmland as classified by the California Department of Conservation, to a non-agricultural use, for the construction of the power generation facility.

Verification: The project owner will provide a mitigation fee payment to a City of Turlock or Stanislaus County agricultural land trust or the American Farmland Trust within 30 days following the construction start, as set forth in a prepared Farmlands Mitigation Agreement. The receipt for this payment will be submitted to the CPM. The payment amount shall be determined by contacting the local assessor's office to determine the assessed value for 18 acres of prime agricultural land; or by a real estate appraiser selected by the project owner and approved by the CPM.

In lieu of the mitigation fee, the project owner could also secure the acquisition of an agricultural easement for other farmland in the vicinity. Easements for prime farmland would be acquired based on the California Department of Conservation's Important Farmland Classification Map, but in no case shall be less than a 1:1 ratio.

The project owner shall provide in its monthly compliance reports a discussion of any land and/or easements purchased in the preceding month by the trust with the mitigation fee money provided, and the provisions to guarantee that the land managed by the trust will be farmed in perpetuity. This discussion must include the schedule for purchasing 18 acres of prime farmland and/or easements within one year of start of construction as compensation for the eighteen acres of prime farmland to be converted by the WEC.

REFERENCES

California Department of Conservation (DOC), 1998. Farmland Mapping and Monitoring Program Map for Stanislaus County. Division of Land Resource Protection, Sacramento.

City of Turlock, 2000. City of Turlock Zoning Ordinance. (online) http://ci.turlock.ca.us/citydepartments/communityplanning/generalplan/index.asp

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NOISE AND VIBRATION

Steve Baker

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the time of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction practices, such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the Walnut Energy Center Project (WEC), and to recommend procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS). For an explanation of technical terms employed in this testimony, please refer to **NOISE Appendix A** immediately following.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time 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 off-site (community) noise.

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects, which have been applied by other jurisdictions to other types of projects. The FTA-recommended vibration standards are expressed in terms of the "vibration level," which is calculated from the peak particle velocity measured from ground-borne vibration. The FTA measure of the threshold of perception is 65 VdB, which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code section 65302(f) encourages each local governmental entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. The state land use compatibility guidelines are listed in **NOISE Table 1**.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence of local noise standards. The Model also contains a definition of a simple tone, or "pure tone," in terms of one-third octave band sound pressure levels that can be used to determine whether a noise source contains annoying tonal components. The Model Community Noise Control Ordinance further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by five dBA.

Other State LORS include the California Occupational Safety and Health Administration (Cal-OSHA) regulations.

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 (see **NOISE Appendix A, Table A4**).

Local

City Of Turlock General Plan

Section 8 of the City's General Plan (Turlock 2002a) is the Noise Element. Subsection 8.1 explains, "All residences are considered sensitive receptors." Subsection 8.2 further declares, "The greatest potential for problems created by industrial noise arises when residential areas are affected."

Subsection 8.4 lists Noise Policies. Policy 8.4-b is a Guiding Policy intended to:

"Protect public health and welfare by…maintaining an acceptable indoor and outdoor acoustic environment, and preventing significant degradation of the acoustic environment. Decreasing noise magnitude at the source…[is an approach] to noise attenuation taken in the City's Noise Control Ordinance…."

NOISE Table 1 — Land Use Compatibility for Community Noise Environment

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE - Ldn or CNEL (dB)						
	50	55	60	65	70	75	80
Residential – Low Density Single Family, Duplex, Mobile Home							
Residential – Multi-Family							
Transient Lodging – Motel, Hotel							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditorium, Concert Hall, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

Source: State of California General Plan Guidelines, Office of Planning and Research, June 1990.

Policy 8.4-j is an Implementing Policy intended to:

"Require mitigation of noise created by new proposed non-transportation noise sources so that it does not exceed the noise level standards of Table 8.4-A as measured immediately within the property line of lands designated for noise-sensitive uses."

Table 8.4-A is reproduced here:

City of Turlock General Plan - Table 8.4-A
Noise Level Performance Standards For Projects Affected By Or Including Non-Transportation Sources

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L_{eq}, dB	55	45
Maximum Level, dB	75	65

Figure 8-2 is a chart entitled "Land Use Compatibility Guidelines for Development." It lists the acceptable limit for noise in residential land uses as 60 dB L_{dn} or CNEL.

City of Turlock Noise Ordinance

The City's Zoning Ordinance (Turlock 2000a) includes Chapter 2, Article 3: Noise Standards. Subsection 9-2-307(a), Exterior noise standards, includes a table, Exterior Noise Limits, that specifies "Levels Not To Be Exceeded More Than 30 Minutes in Any Hour." This table is summarized in **NOISE Table 2** below:

NOISE Table 2 – City of Turlock Noise Ordinance

Receiving Land Use Category	Time Period	Noise Level, dBA L_{50}* Rural/Suburban
Residential One & Two Family	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	40
Multiple Dwellings	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
Light Industrial	Any Time	70
Heavy Industrial	Any Time	75

*Staff agrees with the applicant (TID 2002a, AFC Table 8.5-4) that these figures should be interpreted as decibels L_{50}.

This ordinance also addresses construction noise. Construction hours are restricted to:

- Weekdays 7:00 a.m. to 7:00 p.m.
- Weekends and holidays 9:00 a.m. to 8:00 p.m. (Turlock 2000a, subsection 9-2-309(g)(1))

The permissible loudness of construction noise is limited as summarized in **NOISE Table 3** below (Turlock 2000a, subsection 9-2-309(g)(2)(i) and (ii)):

NOISE Table 3 – City of Turlock Noise Ordinance – Construction Noise Limits

Time Interval	One and Two Family Residential (dBA L_{50})	Commercial & Industrial (dBA L_{50})
Mobile Construction Equipment		
Daily: 7:00 a.m. – 7:00 p.m.	75	85
Weekends/Holidays: 9:00 a.m. – 8:00 p.m.	60	70
Stationary Construction Equipment		
Daily: 7:00 a.m. – 7:00 p.m.	60	70
Weekends/Holidays: 9:00 a.m. – 8:00 p.m.	50	60

Stanislaus County General Plan

The County's General Plan Noise Element identifies single-family and multiple-family residential uses as noise sensitive land uses (Stanislaus 2000, Chapter 4, section 3.0). Figure 3 of the Noise Element is a Land Use Compatibility chart, summarized below in **NOISE Table 4**:

NOISE Table 4 – Stanislaus County Noise Element Land Use Compatibility For Community Noise Environments

Land Use Category	Community Noise Exposure Normally Acceptable (dBA L_{dn} or CNEL)
Residential – Single Family	60
Residential – Multiple Family	65
Industrial, Utilities, Agriculture	75

Note B under this chart specifies, "The land use-noise compatibility recommendations should be viewed in relation to the specific source of the noise."

The Noise Element lists specific goals and policies. Policy Two states:

"It is the policy of Stanislaus County to develop and implement effective measures to abate and avoid excessive noise exposure in the unincorporated areas of the County by requiring that effective noise mitigation measures be incorporated into the design of new noise generating and new noise-sensitive land users."

Under Policy Two, Implementation Measure 2 states:

"New development of industrial, commercial or other noise generating land uses will not be permitted if resulting noise levels will exceed 60 dB L_{dn} (or CNEL) in noise-sensitive areas. Additionally, the development of new noise-generating land uses…will not be permitted if resulting noise levels will exceed the performance standards contained within Table II in areas containing residential or other noise-sensitive land uses."

Table II, entitled "Noise Level Performance Standards," lists Exterior Noise Level Standards for Category I uses (residential) at 50 dB daytime and 45 dB nighttime. It further specifies that, "The standards in Table II should be applied at a residential or other noise-sensitive land use and not on the property of a noise-generating land use."

Table II continues, thus:

Maximum Allowable Noise Exposure – Stationary Noise Sources[1]

	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
Hourly L_{eq}, dB	50	45
Maximum level, dB	70	65

[1]As determined at the property line of the receiving land use.

SETTING

PROJECT BACKGROUND

The Walnut Energy Center Project involves the construction and operation of a nominal 250 MW combined cycle power plant. The WEC would include two General Electric Frame 7EA gas turbine generators with heat recovery steam generators (HRSGs), and one steam turbine generator with a mechanical draft evaporative cooling tower. Also included in the project would be a natural gas compression station.

The equipment that has the greatest potential to generate significant noise levels includes the gas turbines, steam turbine, natural gas fuel compressors, an evaporative cooling tower, and steam relief valve stacks (TID 2002a, AFC §§ 1.2, 2.1, 2.2.2, 2.2.4.1).

Power Plant Site

The project site is located within the City Limits of Turlock, on land optioned by the City. The site is zoned Industrial, and lies on the western edge of Turlock, 2.9 miles west of Highway 99 and south of West Main Street. Surrounding land is in an unincorporated portion of Stanislaus County, and is zoned Agricultural. The site is bounded by industrial and residential uses to the north and east; agricultural and residential uses to the south; and agricultural, residential and utility uses to the west; see **NOISE Figure 1** (TID 2002a, AFC §§ 1.3, 2.2.2, 8.5.4; CH2MHill 2003b, Data Response No. 70).

Linear Facilities

Linear facilities included in the project would consist of:

- a 3.6-mile natural gas pipeline;
- a 1.6-mile recycled water supply pipeline; and
- a 0.9-mile potable water supply pipeline (TID 2002a, AFC §§ 2.2.6, 2.2.7, 6.1, 6.2, 7.2, 7.3).

ANALYSIS

The project must not only comply with the noise LORS described above, but must also be examined for adverse impacts under the California Environmental Quality Act (CEQA).

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., tit. 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

a) exposure of persons to, or generation of, noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;

b) exposure of persons to or generation of excessive 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; or

d) a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The Energy Commission staff, in applying item c) above to the analysis of this and other projects, has concluded that a potential for a significant noise impact exists where the noise of the project plus the background exceeds the background by five dBA L_{90} or more at the nearest sensitive receptor.

Staff considers it reasonable to assume that an increase in background noise levels up to 5 dBA in a residential setting is insignificant; an increase of more than 10 dBA is clearly significant. An increase between 5 and 10 dBA should be considered adverse, but may be either significant or insignificant, depending on the particular circumstances of a case.

Factors to be considered in determining the significance of an adverse impact as defined above include:

1. the resulting noise level[1];
2. the duration and frequency of the noise;
3. the number of people affected;
4. the land use designation of the affected receptor sites; and

[1] For example, a noise level of 40 dBA would be considered quiet in many locations. A noise limit of 40 dBA would be consistent with the recommendations of the California Model Community Noise Control Ordinance for rural environments, and with industrial noise regulations adopted by European jurisdictions. If the project would create an increase in ambient noise no greater than 10 dBA at nearby sensitive receptors, and the resulting noise level would be 40 dBA or less, the project noise level would likely be insignificant.

5. public concern or controversy as demonstrated at workshops or hearings, or by correspondence.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

1. the construction activity is temporary;
2. use of heavy equipment and noisy activities is limited to daytime hours; and
3. all industry-standard noise abatement measures are implemented for noise-producing equipment.

Existing Noise Levels

In order to predict the likely effects of project noise on adjacent sensitive receptors, the applicant commissioned an ambient noise survey of the area. The survey was conducted on Monday and Tuesday, July 29 and 30, 2002, using acceptable equipment and techniques. The noise survey monitored existing noise levels at the following four locations, shown on **NOISE Figure 1**.

1. Monitoring Location M1: Adjacent to the residence at the end of Ruble Road, approximately 375 feet south of the project site boundary. Existing noise is due chiefly to agricultural operations, the existing Walnut Power Plant, and a livestock feed processing plant.
2. Monitoring Location M2: At the residence on West Main Street, approximately 1,450 feet north of the site. Existing noise is due to many of the same sources as at Location M1, plus traffic noise.
3. Monitoring Location M3: Across from the residence on West Main Street at Washington Street, approximately 3,500 feet northwest of the project site. Existing noise includes traffic noise.
4. Monitoring Location M4: At the residence on Washington Street, approximately 2,600 feet west of the project site. Existing noise consists chiefly of agricultural operations and traffic noise.

[Insert **NOISE Figure 1** here; use Figure 8.5-2R1 from Data Response Set 1A dated February 18, 2003]

One-hour and 10-minute ambient noise measurements are detailed in the Application (TID 2002a, AFC Appendix 8.5B). **NOISE Table 5** summarizes these noise measurements (TID 2002a, AFC Table 8.5-9):

NOISE Table 5 — Summary of Measured Noise Levels

Monitoring Location	Level in dBA, L_{dn}	Nighttime Average L_{90}, dBA (10 p.m. – 7 a.m.)
M1 – Residence on Ruble Road	71	55
M2 – Residence on West Main Street	63	51
M3 – Across from residence on West Main at Washington Street	68	59
M4 – Residence on Washington Street	62	47

In general, the noise environment in the vicinity of the project site is dominated by industrial noise, agricultural operations, and road and rail traffic during the day; and by industrial noise, traffic and agricultural operations at night. The neighborhood is rather noisy, day and night.

IMPACTS AND COMPLIANCE WITH LORS

Noise impacts associated with the project can be created by short-term construction activities, and by normal long-term operation of the power plant.

PROJECT CONSTRUCTION

Community Effects

General Construction Noise

Construction noise is usually considered a temporary phenomenon. Construction of the WEC is expected to last approximately 24 months (TID 2002a, AFC §§ 1.4, 2.2.15). Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours of the day is commonly exempt from enforcement by local ordinances. The City of Turlock Noise Ordinance, however, limits the level of construction noise, and limits such noise to certain hours (Turlock 2000a, subsection 9-2-309(g)(1) and 9-2-309(g)(2)). As described above, construction hours are restricted to:

- Weekdays 7:00 a.m. to 7:00 p.m.
- Weekends and holidays 9:00 a.m. to 8:00 p.m.

Permissible construction noise levels are described in **NOISE Table 3** above.

The applicant has predicted construction noise impacts, listing expected noise levels at the project site (TID 2002a, AFC Table 8.5-10) and at the sensitive receptors (TID

2002a, AFC Tables 8.5-11 and 8.5-12). These predicted construction noise impacts at the receptors are summarized in **NOISE Table 6**:

NOISE Table 6 – Applicant's Construction Noise Impact Predictions

Monitoring Location	Approximate Distance from Noise Source (feet)	Loudest Predicted Sound Level, dBA*
M1 – Residence on Ruble Road	375	71
M2 – Residence on West Main Street	1,500	59
M3 & M4 – Residence on West Main at Washington Street, and residence on Washington Street	3,000	53

*Includes silenced steam blows

The applicant has committed to restrict noisy construction work to the hours mandated in the City Noise Ordinance (TID 2002a, AFC §§ 8.5.5.2.2, 8.5.6). To ensure compliance with this requirement, staff proposes Condition of Certification **NOISE-8** below.

Since noisy construction work will take place during the daytime, staff has compared predicted noise levels to the daytime ambient noise regime at the potentially affected sensitive receptors, which include 24 residences (CH2MHill 2003b, Data Response No. 70). Further, since construction noise typically varies from moment to moment, staff compares it to the ambient L_{eq} or L_{50} levels in the affected area. Averaging the L_{eq} levels at the four noise monitoring sites over the twelve hours during which construction is permitted on a weekday (TID 2002a, AFC Appendix 8.5B, Tables 8.5B-1 through 8.5B-4), and comparing them to the applicant's predicted construction noise levels yields **NOISE Table 7**:

NOISE Table 7 – Staff's Projected Construction Noise Impacts

Monitoring Location	Loudest Projected Sound Levels, dBA L_{eq}[1]	Daytime Average Ambient, dBA L_{eq}[2]	Resultant Level, dBA L_{eq}	Increase over Ambient, dBA
M1 – Residence on Ruble Road	71	56	71	+15
M2 – Residence on West Main Street	59	57	61	+4
M3 – Residence on West Main at Washington Street	53	63	63	0
M4 – Residence on Washington Street	53	58	59	+1

[1]Source: TID 2002a, AFC Table 8.5-11
[2]Staff calculation; encompasses the time period from 7 a.m. to 7 p.m.

Construction noise at the receptors near monitoring location M2 will be audible but not annoying; construction noise at the receptors near monitoring locations M3 and M4 should be largely unnoticeable. Only at the three residences near monitoring location

M1 should construction noise be noticeable, and potentially annoying. Due to the small number of affected residences, and the fact that noisy construction work will be restricted to daytime hours, staff believes that construction noise should be tolerable to these residents. Staff proposes Condition of Certification **NOISE-2**, a noise complaint resolution process, to deal with any noise complaints related to this work.

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 feed water 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. Traditionally, high pressure steam is then raised in the heat recovery steam generator 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 was then ready for operation.

In the case of the WEC, these high-pressure steam blows could produce noise as loud as 129 dBA at a distance of 50 feet. In order to reduce disturbance from steam blows, the applicant has committed to equipping the steam blow piping with a silencer that would reduce noise levels by 40 to 45 dBA (TID 2002a, AFC §§ 8.5.5.2.2).

In recent years, a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™, has become popular. This method utilizes lower pressure steam over a continuous period of 36 hours or so. Noise levels at nearby receptors are typically similar to the ambient background noise level, and thus barely noticeable. Even more recently, compressed air has been substituted for steam in the continuous blow process, with resulting noise levels that are similar.

The applicant has predicted high-pressure steam blow noise levels at the nearest sensitive receptors (TID 2002a, AFC Table 8.5-12). Silenced high-pressure steam blows would result in noise impacts at the residences near monitoring location M1, the nearest and most heavily impacted location, of approximately 71 dBA L_{eq}. As discussed above, staff believes these levels would be tolerable to residents. Low pressure steam blows would create noise levels that would be even lower.

In order to ensure minimal annoyance due to steam or air blows, staff proposes conditions of certification to limit noise from the short duration, high-pressure steam blows by requiring the use of a temporary silencer to achieve the noise level cited above, to implement a notification process to make neighboring land uses aware of impending steam blows (see proposed Conditions of Certification **NOISE-4** and **NOISE-**

5 below), and to restrict such work to daytime hours (see proposed Condition of Certification **NOISE-8**). If a low-pressure, continuous steam or air blow process is used, the proposed Condition of Certification **NOISE-4** will ensure that the resulting continuous noise levels do not exceed the LORS nighttime noise standards, or cause a significant increase in nighttime ambient noise levels. This should ensure the process is tolerable to residents and adjacent land uses.

Linear Facilities

New off-site linear facilities would include a 3.6-mile natural gas pipeline, a 1.6-mile recycled water supply pipeline, and a 0.9-mile potable water supply pipeline.

Construction of linear facilities typically moves along at a rapid pace, thus not subjecting any one receptor to noise impacts for more than two or three days. Further, the City's Noise Ordinance (Turlock 2000a, subsections 9-2-309(g)(1) and (g)(2)) limits both the hours of construction and the permissible noise levels. Staff believes that compliance with this ordinance will offer sufficient protection to affected receptors. Staff proposes Condition of Certification **NOISE-8** to ensure that these requirements are met.

Vibration

The only construction operation likely to produce vibration that could be perceived off-site would be pile driving. The applicant anticipates no pile driving will be required for construction of the WEC (TID 2002a, AFC § 8.5.5.2.3); therefore, no vibration impacts are likely.

Worker Effects

The applicant has acknowledged the need to protect construction workers from noise hazards, and has recognized those applicable LORS that would protect construction workers (TID 2002a, AFC § 8.5.5.2.1). To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-3**.

PROJECT OPERATION

Community Effects

Power plant noise is unique. A power plant operates as essentially a steady, continuous noise source, unlike the intermittent sounds that comprise the majority of the noise environment. As such, power plant noise contributes to, and becomes part of, the background noise level, or the sound heard when most intermittent noises cease. Where power plant noise is audible, it will tend to define the background noise level. For this reason, staff compares the projected power plant noise to the existing ambient background (L_{90}) noise levels at the affected sensitive receptors. If this comparison identifies a significant adverse impact, then feasible mitigation must be incorporated in the project to eliminate or reduce the impact.

In most cases, a power plant will be intended to operate around the clock for much of the year. Staff believes it prudent to average the lowest nighttime hourly background noise level values to arrive at a reasonable baseline for comparison with the project's

projected noise level. This assumes the potential for annoyance due to power plant noise is greatest at night when residents are trying to sleep.

In addition, staff compares the projected project noise with applicable LORS, in this case, the City of Turlock General Plan Noise Element and Noise Ordinance, and the Stanislaus County General Plan Noise Element.

Power Plant Operation

During its operating life, the WEC would represent essentially a steady, continuous noise source day and night. Occasional brief increases in noise levels would occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant would be shut down for lack of dispatch or for maintenance, noise levels would decrease.

The primary noise sources of the project would include the gas turbine generators, the steam turbine generator, gas turbine air inlets, HRSG exhaust stacks, natural gas fuel compressors, electrical transformers, and various pumps. The noise emanating from a power plant during normal operation is generally broadband, steady state in nature.

The applicant performed noise monitoring to quantify the ambient noise regime at sensitive receptors near the project site (TID 2002a, AFC Appendix 8.5B), presenting the results in terms of L_{dn} (a 24-hour measure) and of a nighttime (10 p.m. to 7 a.m.) average L_{90}, or background, level (see **NOISE Table 5** above). Staff typically examines the L_{90} values averaged over the four quietest consecutive hours of the night; we believe this gives the most meaningful indication of noise levels when people are trying to sleep. (In this case, due largely to frequent noise throughout the night, the nighttime average L_{90} values are only about one decibel higher than the four-hour average L_{90} values at all four monitoring locations.)

The applicant performed acoustical modeling to determine the project's noise impacts on sensitive receptors (TID 2002a, AFC Table 8.5-14). These projections are shown in NOISE Table 8:NOISE Table 8 – Projected Plant Operational Noise Impacts (dBA)

Monitoring Location	Ambient Four-Hour Average Background (L_{90})[1]	Projected Power Plant Noise Level (L_{dn})[2]	Projected Power Plant Noise Level (L_{eq})[2]	Resultant Level (L_{eq})[3]
M1 – Residence on Ruble Road	54	69	63	64
M2 – Residence on West Main Street	50	69	63	63
M3 – Across from residence on West Main at Washington Street	58	61	55	60
M4 – Residence on Washington Street	46	66	60	60

[1]Source: Staff calculation based on applicant's hourly values (TID 2002a, AFC Tables 8.5B-1 through 8.5B-4)
[2]Source: TID 2002a, AFC Table 8.5-14
[3]Staff calculation, based on adding project noise to four-hour average background noise levels

Compliance With City Noise Ordinance

Based on the above projected L_{dn} values, the applicant has concluded that the project will comply with all applicable LORS (TID 2002a, AFC §§ 1.7.5, 8.5.3.3, 8.5.5.1; Appendix 8.5A). TID notes that the City of Turlock Noise Ordinance sets a standard of 75 dBA L_{50} [1] for industrial zones. The project noise level of 55 to 63 dBA at the receptors would comply with this limit.

Note that the City Noise Ordinance sets a standard of 40 dBA for single family residences. Such a level is clearly exceeded by the projected project levels ranging from 61 to 69 dBA L_{dn}. The applicant presents a letter from a City planner, explaining that the residences involved "…are not considered sensitive land uses because they are located within the City of Turlock's 'Industrial' zoning district." (TID 2002a, AFC Appendix 8.5A)

This interpretation is of only limited relevance, however. **NOISE Figure 1** shows that there are at least 24 residences within the 55 dB L_{dn} noise contour of the project (TID 2002a, AFC Figure 8.5-4; CH2MHill 2003b, Data Response No. 70, Figure 8.5-2R1); only two of these residences (the one at monitoring location M2, and one east of monitoring location M1) lie within the Turlock City Limits and the industrially zoned land. The remaining 22 residences lie in unincorporated portions of Stanislaus County, on land zoned agricultural (see below).

[1] The City Noise Ordinance describes "Levels Not To Be Exceeded More Than 30 Minutes in Any Hour." Staff and applicant interpret this as L_{50}. For steady-state power plant noise, L_{50} and L_{eq} are very similar.

Compliance With City Noise Element

The City General Plan Noise Element lists the acceptable noise limit for residential land uses as 60 dB L_{dn} or CNEL. The projected noise levels (**NOISE Table 8** above) of 61 to 69 dB exceed this value. The Noise Element also sets a performance standard of 45 dB L_{eq} during the nighttime. The projected power plant noise levels of 55 to 63 dB (see **NOISE Table 8**) exceed this figure by as much as 18 dB, a level nearly four times as loud as the standard. Indeed, even the ambient background noise levels exceed this standard by as much as 13 dB. In such cases, it is customary to increase the standard in 5 dB increments until it matches or exceeds the ambient. In this case, it could be appropriate to increase the standard to 50 dBA at monitoring locations M2 and M4; to 55 dBA at M1; and to 60 dBA at M3. The project would then be in compliance at M3, but not at the remaining locations.

Compliance With County Noise Element

The Stanislaus County Noise Element sets a standard of 60 dBA L_{dn} or CNEL for single-family residences (Stanislaus 2000, Chapter 4, Figure 3). The applicant's own projections (see **NOISE Table 8** above) show that the project would exceed this level at all measured receptor locations. In fact, the ambient noise levels exceed this value by as much as 11 dBA (see **NOISE Table 5**). If the standard were increased in 5 dB increments to match the ambient levels, it would be adjusted to 65 dBA at monitoring locations M1 and M4; to 70 dBA at M3; and to 75 dBA at M1. The project would then comply at M1 and M3, but not at M2 and M4 (see **NOISE Table 8**).

The Noise Element further limits the maximum allowable noise exposure for stationary sources to 45 dBA L_{eq} during the nighttime. As above, the project would fail to comply with this limit by as much as 18 dB.

Note further that the applicant identifies 22 residences on County land, outside the Turlock City Limit. A residence is considered a conforming use on agriculturally zoned land. Thus, City LORS do not apply to these residences (unless they are more stringent than County LORS). Rather, the County General Plan Noise Element is the effective LORS.[2]

Significant Impacts Under CEQA

The project must be analyzed under CEQA to determine if significant adverse impacts will result. The applicant incorrectly assumes that, "[s]ince the noise level at the nearest receptor will be in accordance with local LORS, no adverse impact is expected from the normal operation of the plant" (TID 2002a, AFC § 1.7.5), and "[t]herefore, noise impacts may be considered significant if project operational activities would conflict with the City of Turlock Noise Ordinance…." (TID 2002a, AFC § 8.5.5.1)

As described above (see the CEQA subsection under the heading "Analysis"), staff typically considers an increase above background noise levels greater than 10 dBA to

[2] In the AFC, the applicant dismisses the County Noise Element by stating, "Residences are not identified as 'noise sensitive.'" (TID 2002a, AFC Table 8.5-6) The County Noise Element specifically states, "The following noise sensitive land uses have been identified within Stanislaus County: 1. Residential use in Single-Family Residential…zones…." (Stanislaus 2000, Chapter 4, section 3.0)

constitute a significant adverse impact. As shown in **NOISE Table 8** above, the project would cause increases in the four-hour average background noise level at each of the monitoring locations. The magnitude of this increase is shown in **NOISE Table 9**:

NOISE Table 9 – Projected Plant Operational Noise Increases (dBA)

Monitoring Location	Ambient Four-Hour Average Background (L_{90})[1]	Projected Power Plant Noise Level (L_{eq})[2]	Resultant Level L_{eq}[3]	Increase above Background[3]
M1 – Residence on Ruble Road	54	63	64	+10
M2 – Residence on West Main Street	50	63	63	+13
M3 – Across from residence on West Main at Washington Street	58	55	60	+2
M4 – Residence on Washington Street	46	60	60	+14

[1]Source: Staff calculation based on applicant's hourly values (TID 2002a, AFC Tables 8.5B-1 through 8.5B-4)
[2]Source: TID 2002a, AFC Table 8.5-14
[3]Staff calculation

An examination of the aerial photograph depicting the project site (CH2MHill 2003b, Data Response No. 70, Figure 8.5-2R1) shows that each monitoring location represents at least three nearby residences. Thus, at least six residences (those at or near monitoring locations M2 and M4) will be subjected to nighttime noise increases of 13 to 14 dBA, a significant and likely annoying increase.

In order to reduce project noise impacts on nearby residences to a level that staff considers insignificant (an increase no greater than 10 dB), the project noise emissions would have to be reduced at least 3 dBA toward the north (monitoring location M2) and at least 4 dBA toward the southwest (monitoring location M4). This might be accomplished by incorporating in the project design one or more of the following features, which staff has seen employed on other power plants:

1. relocating some plant equipment;
2. enclosing some equipment in sound attenuating enclosures;
3. erecting sound walls at the power plant, or near affected receptors;
4. purchasing quieter version of some pieces of plant equipment, such as pumps or transformers; or
5. installing exhaust stack silencers.

To ensure that the plant would not exceed staff's recommended noise levels at any sensitive receptor, staff has proposed Condition of Certification **NOISE-6** below.

Tonal and Intermittent Noises

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. Intermittent noises would include steam relief valves venting during startup, shutdown or unplanned unit trips. The applicant plans to pay attention to overall noise in design, and to install appropriate vent silencers to eliminate these factors as possible sources of annoyance (TID 2002a, AFC § 8.5.6).

Linear Facilities

All water and gas piping will lie underground, and will be silent during operation. Noise effects from the electrical interconnection line typically do not extend beyond the right-of-way easement of the line, and will thus be inaudible to any receptors. This will be particularly true for the medium-voltage (69 kV and 115 kV) lines associated with this project (TID 2002a, AFC § 8.5.5.3.2).

Vibration

Vibration from an operating power plant could be transmitted by two chief means; through the ground (groundborne vibration), and through the air (airborne vibration).

The operating components of a combined cycle power plant consist of high-speed gas and steam turbines and various pumps. All of these pieces of equipment must be carefully balanced in order to operate; permissible vibration levels are quite low. The applicant claims that no vibration will be felt offsite (TID 2002a, AFC § 8.5.5.3.5). Energy Commission staff agrees with this estimate, and agrees with the applicant that groundborne vibration from the WEC will be undetectable by any likely receptor.

Airborne vibration (low frequency noise) can rattle windows and objects on shelves, and can rattle the walls of lightweight structures. The WEC's chief source of airborne vibration would be the gas turbines' exhaust. In a combined cycle plant such as the WEC, however, the exhaust must pass through the HRSGs before it reaches the atmosphere. The HRSGs act as extremely efficient mufflers; it would be exceedingly rare for such a plant to cause perceptible airborne vibration effects.

Worker Effects

The applicant has acknowledged the need to protect plant operating and maintenance workers from noise hazards, and has committed to comply with applicable LORS (TID 2002a, AFC §§ 8.5.5.3.1). The applicant would implement a comprehensive hearing conservation program, and hearing protection would be required. To ensure that plant operating and maintenance workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-7**.

CUMULATIVE IMPACTS

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect

the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

Neither the applicant nor Energy Commission staff is aware of any other similar projects in the immediate area. Since noise impacts from two projects can only accumulate if the projects are relatively near each other, i.e., within less than half a mile, staff believes no cumulative noise impacts are likely for the WEC.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed Walnut Energy Center project (please refer to **Socioeconomics Figure 1** in this document). However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff considers these to be pockets or clusters. Staff also reviewed Census 2000 information that shows the low-income population is less than 50 percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for **Noise and Vibration**.

Based on the **Noise and Vibration** analysis, which included consideration of information supplied by participants at staff workshops, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no **Noise and Vibration** environmental justice issues related to this project.

FACILITY CLOSURE

In the future, upon closure of the WEC, all operational noise from the project would cease, and no further adverse noise impacts from operation of the WEC would be possible. The remaining potential temporary noise source is the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction of the WEC, it can be treated similarly. That is, noisy work could be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that were in existence at that time would apply. Applicable conditions of certification included in the Energy Commission Decision would also apply unless modified.

CONCLUSIONS AND RECOMMENDATIONS

Energy Commission staff concludes that the WEC, constructed and operated with the applicant's proposed mitigation measures, would fail to comply with all applicable noise laws, ordinances, regulations and standards. The project would comply with the City of Turlock Noise Ordinance, but would be unable to comply with the City of Turlock General Plan Noise Element, and with the Stanislaus County General Plan Noise Element.

Staff concludes that if the WEC is built as described above, it can be expected to produce significant adverse noise impacts at six or more residences. Staff further concludes that the project could be further mitigated to reduce its noise emanations to the point that the project would comply with CEQA, and present no significant adverse noise impacts on sensitive receptors. Such additional mitigation would create no cumulative impacts with another project, and cause no significant direct or cumulative noise impacts to an environmental justice population.

Energy Commission staff recommends the Commission grant overrides of the City of Turlock General Plan Noise Element and the Stanislaus County General Plan Noise Element. To ensure compliance with CEQA and mitigation of noise impacts to less than significant levels, staff recommends adoption of the following Conditions of Certification.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within one-half mile of the site and the linear facilities, 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: Prior to ground disturbance, the project owner shall transmit to the CPM a statement, signed by the project manager, stating that the above notification has been performed, and describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

NOISE COMPLAINT PROCESS

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. The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (below), 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 five days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form with the local jurisdiction and the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

NOISE-3 The project owner shall submit to the CPM for review and approval 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 ground disturbance, the project owner shall submit to the CPM the noise control program. The project owner shall make the program available to Cal-OSHA upon request.

STEAM BLOW MANAGEMENT

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 89 dBA measured at a distance of 50 feet. The project owner shall conduct steam blows only during the hours specified in Condition of Certification **NOISE-8**, 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 or air 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, who shall review the proposal with the objective of ensuring that the resulting noise levels will not exceed 45 dBA L_{eq} measured at any of the four noise monitoring locations identified in the Application for Certification. If the low-pressure process is approved by the CPM, the project owner shall implement it in accordance with the requirements of 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.

STEAM BLOW NOTIFICATION

NOISE-5 Prior to the first steam blow(s), the project owner shall notify all residents and business owners within one 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: Project owner shall notify residents and businesses at least 15 days prior to the first steam blow(s). Within five 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 RESTRICTIONS

NOISE-6 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project will not cause noise levels due to plant operation to exceed the values shown here, measured at the four monitoring locations employed in the applicant's pre-application survey:

Monitoring Location	Noise Due to Project (dBA L_{eq})
M1 – Residence on Ruble Road	63
M2 – Residence on West Main Street	60
M3 – Across from residence on West Main at Washington Street	55
M4 – Residence on Washington Street	56

No new pure-tone components may be 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.

A. When the project first achieves a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at the four monitoring sites. This survey during power plant operation shall also include measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure-tone noise components have been introduced.

B. If the results from the noise survey indicate that the power plant noise level (L_{eq}) at the affected receptor exceeds the above value for any given hour during the 25-hour period, or that the noise standards of the LORS have been exceeded, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

C. If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: The survey shall take place within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey 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. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

NOISE-7 Following the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility.

The survey 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.

CONSTRUCTION TIME RESTRICTIONS

NOISE-8 Heavy equipment operation and noisy construction work relating to any project features that lie within 300 feet of residences, including steam blows, shall be restricted to the times of day delineated below:

Monday through Friday	7 a.m. to 7 p.m.
Weekends and Holidays	9 a.m. to 8 p.m.

Construction noise levels, measured at the nearest residence or business, may not exceed the following values:

Construction Noise Limits

Time Interval	One and Two Family Residential (dBA L_{50})	Commercial and Industrial (dBA L_{50})
Mobile Construction Equipment		
Daily: 7:00 a.m. – 7:00 p.m.	75	85
Weekends/Holidays: 9:00 a.m. – 8:00 p.m.	60	70
Stationary Construction Equipment		
Daily: 7:00 a.m. – 7:00 p.m.	60	70
Weekends/Holidays: 9:00 a.m. – 8:00 p.m.	50	60

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

Verification: **EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM**

Walnut Energy Center Project
(02-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).

REFERENCES

CH2MHill (CH2MHill, Sacramento, California) 2003 b. Data Response, Set 1A. Submitted to the California Energy Commission on February 18, 2003.

Stanislaus (Stanislaus County) 2000. General Plan, updated 2000.

TID (Turlock Irrigation District) 2002 a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 19, 2002.

Turlock (City of Turlock). 2000 a. Zoning Ordinance, dated 2002.

Turlock (City of Turlock) 2002 a. City of Turlock General Plan, dated 2002.

NOISE APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **Noise Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (L_{eq}), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (L_{dn}). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical L_{dn} values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (Effects of Noise on People, U.S. Environmental Protection Agency, December 31,1971).

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 sound levels, in dBA.

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, dBA	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 4.8 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} or DNL	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.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.

Source: Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Control Ordinance, California Department of Health Services 1976, 1977.

Noise Table A2 Typical Environmental and Industry Sound Levels			
Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
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	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

Source: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980

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 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 three 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 ten dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response. (Kryter, Karl D., The Effects of Noise on Man, 1970)

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: Architectural Acoustics, M. David Egan, 1988

Sound and Distance

Doubling the distance from a noise source reduces the sound pressure level by six 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: 29 C.F.R. § 1910.95

PUBLIC HEALTH

Obed Odoemelam, Ph.D.

INTRODUCTION

The purpose of this Public Health analysis is to determine if toxic emissions from the proposed Walnut Energy Center (WEC) would have the potential to cause significant adverse public health impacts or to violate standards for public health protection. If potentially significant health impacts are identified, staff will evaluate mitigation measures to reduce such impacts to insignificant levels.

Although staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section of this Preliminary Staff Assessment (PSA), **Attachment A** at the end of this section provides information on the health effects of such pollutants. Impacts on public and worker health from accidental releases of hazardous materials are examined in the **Hazardous Materials Management** section. Health effects from electromagnetic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project in wastewater streams to the public sewer system are discussed in the **Soils and Water Resources** section. Plant releases in the form of hazardous and non-hazardous wastes are described in the **Waste Management** section.

The following sections describe staff's method of analyzing potential health impacts and the criteria used to determine their significance.

METHOD OF ANALYSIS

The Public Health section of this staff assessment discusses toxic emissions to which the public could be exposed during project construction and routine operation. Following the release of toxic contaminants into the air or water, people may come into contact with them through inhalation, dermal contact, or ingestion via contaminated food or water.

Air pollutants for which no air quality standards have been set are called noncriteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, non-criteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone.

Since non-criteria pollutants do not have such standards, a process known as health risk assessment is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The risk assessment procedure consists of the following steps:

- Identification of the types and amounts of hazardous substances that the WEC could emit to the environment;
- Estimation of worst-case concentrations of project emissions in the environment using dispersion modeling;

- Estimation of the amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact; and
- Characterization of the potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Initially, a screening level risk assessment is performed using simplified assumptions that are intentionally biased toward protection of public health. That is, an analysis is designed that overestimates public health impacts from exposure to project emissions. In reality, it is likely that the actual risks from the power plant will be much lower than the risks which are estimated by the screening level assessment. This is accomplished by examining conditions that would lead to the highest, or worst-case risks, and then using those in the study. Such conditions include:

- Using the highest levels of pollutants that could be emitted from the plant;
- Assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- Using the type of air quality computer model which predicts the greatest plausible impacts;
- Calculating health risks at the location where the pollutant concentrations are calculated to be the highest;
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and
- Assuming that an individual's exposure to cancer-causing agents occurs for 70 years.

A screening level risk assessment will, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances which could present a health hazard from non-inhalation pathways of exposure (see California Air Pollution Control Officers Association (CAPCOA) 1993, Table III-5). When these substances are present in facility emissions, the screening level analysis includes the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (CAPCOA 1993, p. III-19).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) non-cancer effects, and cancer risk (also long-term). Acute health effects result from short-term (one-hour) exposure to relatively high concentrations of pollutants. Acute effects are temporary in nature, and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic health effects are those which arise as a result of long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from ten to one hundred percent of a lifetime (from seven to seventy years). Chronic health effects include diseases such as reduced lung function and heart disease.

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels called “reference exposure levels” or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects (CAPCOA 1993, p. III-36). These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease which makes them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature, and include margins of safety. The margin of safety addresses uncertainties associated with inconclusive scientific and technical information available at the time of standard setting and is meant to provide a reasonable degree of protection against hazards that research has not yet identified. The margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection is achieved if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety exists between the predicted exposure and the estimated threshold dose for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformance with CAPCOA guidelines, the health risk assessment assumes that the effects of each substance are additive for a given organ system (CAPCOA 1993, p. III-37). In those cases where the actions may be synergistic (where the effects are greater than the sum), this approach may underestimate the health impact.

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions.

Cancer risk is expressed in chances per million, and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called “potency factors”, and established by the California Office of Environmental Health Hazard Assessment), and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be considerably lower than those estimated.

The screening analysis is performed to assess worst-case risks to public health associated with the proposed project. If the screening analysis predicts no significant risks, then no further analysis is required. However, if risks are above the significance level, then further analysis, using more realistic site-specific assumptions would be performed to obtain a more accurate assessment of potential public health risks.

SIGNIFICANCE CRITERIA

Commission staff determines the health effects of exposure to toxic emissions based on impacts to the maximum exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using worst-case assumptions, as described above.

As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) non-cancer health effects, as well as cancer (long-term) health effects. Significance of project health impacts is determined separately for each of the three categories.

Acute and Chronic Noncancer Health Effects

Staff assesses the significance of non-cancer health effects by calculating a "hazard index." A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than one signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance which has the same type of health effect is added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that cumulative worst-case exposures are less than the reference exposure levels (safe levels). Under these conditions, health protection is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant non-cancer project-related public health impacts.

Cancer Risk

Staff relied upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance to determine a cancer risk significance level. Title 22, California Code of Regulations, section 12703(b) states that "the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure." This level of risk is equivalent to a cancer risk of ten in one million, or 10×10^{-6}. An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than that which applies to Proposition 65.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. When a screening analysis shows cancer risks to be above the significance level, refined assumptions would likely result in a lower, more realistic risk estimate. If facility risk, based on refined assumptions, exceeds the significance level of ten in one million, staff would require appropriate measures to reduce risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than ten in one million, staff would deem such risk to be significant, and would not recommend project approval.

LAWS ORDINANCES, REGULATIONS AND STANDARDS

The following Laws, Ordinances, Regulations and Standards (LORS) were established to protect against the impacts of the noted criteria pollutants and the air toxics-related impacts of specific concern in this analysis.

FEDERAL

The Clean Air Act of 1970 (42 U.S.C., section 7401 et seq.)

This section of the act required establishment of the previously noted ambient air quality standards necessary to protect the public against effects in humans and the general environment. These standards were established by the United States Environmental Protection Agency (U.S. EPA) for the major criteria pollutants: nitrogen oxides (NOx), ozone, sulfur dioxide, carbon monoxide, sulfates, lead, and particulate matter with a diameter of 10 microns or less (PM10).

The Clean Air Act of 1970 (42 U.S.C., section 7412)

This section requires new sources, which emit more than 10 tons per year of air toxics or any combination of air toxics, to apply the Maximum Achievable Control Technology (MACT).

STATE

California Health and Safety Code section 39606

This section of the code requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions influencing its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride, and nitrogen dioxide. The California standards are listed together with the corresponding federal standards in the **Air Quality** section.

California Health and Safety Code section 41700

This section of the code 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."

California Health and Safety Code section 39650 et seq.

This section of the code mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, non-criteria air pollutants, and identify the best available methods for controlling their emission. These laws also require that the new source review rules for each air district include regulations establishing procedures for controlling the emission of these pollutants. The toxic emissions from natural gas combustion are listed in ARB's Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines to allow for uniform assessment as emitted from combustion and non-combustion sources in the state. Cal-EPA has developed

specific cancer potency estimates for assessing any cancer risk that these air toxics may pose at specific exposure levels. For toxic air pollutants that do not cause cancer, Cal-EPA established specific no-effects levels (known as reference exposure levels or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels. Staff uses these Cal-EPA potency estimates and reference exposure values in its health risk analyses.

Health and Safety Code section 44300 et seq.

This section of the code requires facilities, which emit large quantities of criteria pollutants, and any amount of non-criteria pollutants, to provide the local air district an inventory of toxic emissions. Operators of such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The ARB ensures statewide implementation of these requirements through the state's air districts.

LOCAL

San Joaquin Valley Unified Air Pollution Control District Rule 2201

This rule requires safe exposure limits for toxic air pollutants, use of Best Available Control Technology (BACT) and New Source Review (NSR).

SETTING

This section describes the environment in the vicinity of the proposed project site from the public health perspective. Features of the natural environment, such as meteorology and terrain, affect the project's potential for causing impacts on public health. An emissions plume from a facility may affect elevated areas before lower terrain areas, due to a reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influence the surrounding population distribution and density which, in turn, affects public exposure to project emissions. Additional factors affecting potential public health impacts include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

According to the information from the applicant (TID 2002a, pages 1-2, through 1-4, 8.1-1, 8.5-9, and 8.6-3), the WEC is proposed for an 18-acre site within a 69-acre land parcel located southwest of the intersection of West Main Street and South Washington Road in the City of Turlock, in Stanislaus County, California. The site is in an area of mixed agricultural and industrial uses, which include the existing Walnut Power Plant and related substation. Agricultural uses are located to the south, with agricultural, residential and utility uses to the west. The site is relatively flat with an average elevation of 85 feet above sea level. The nearest residences (which are isolated farm residences) are located approximately 375 ft to the south, at the end of Ruble Road.

The applicant (TID 2002a, pages 8.12-5 through 8-12-7) has provided a listing of the locations with sensitive receptors within a three-mile radius of the site. A sensitive

receptor location, for purposes of a public health analysis, is an establishment that houses sensitive individuals such as children, the elderly, and individuals with respiratory diseases. The institutions in this case were identified as day-care facilities, convalescent homes, hospitals, and schools. Since these individuals are more sensitive than the average individual to the effects of environmental pollutants, their response is specifically considered in establishing the safe exposure limits for such pollutants. However, staff holds all projects to the same health standards whether proposed for a major population center, with many sensitive receptors, or a sparsely populated area with relatively few.

METEOROLOGY

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into ambient air as well as the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants and associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced and localized exposure may be increased.

The climate at the project site is dominated by the influence of the Pacific Ocean and the Pacific high-pressure system, which is a semi-permanent, subtropical high-pressure system located off the coast. The size and strength of the Pacific high is at a maximum during the summer, when it is at its northernmost position, and results in strong northwesterly airflow and negligible precipitation. During this period, inversions become strong, winds are light, and the pollution potential is high. The Pacific high's influence weakens during the fall and winter when it moves southwestward, which allows storms from the Gulf of Alaska to reach northern California. About 80 percent of the region's annual rainfall of about 12 inches occurs between November and March. During the winter, inversions are weak, winds often moderate, and the potential for air pollution is low.

Atmospheric stability is a measure related to turbulence, or the ability of the atmosphere to disperse pollutants due to convective air movement. Mixing heights (the height above ground level below which the air is well mixed and in which pollutants can be dispersed) are lower during the morning hours because of temperature inversions which, are followed by temperature increases in the warmer afternoons. Staff's **Air Quality** section presents a more detailed discussion of the area's meteorology.

EXISTING AIR QUALITY

The proposed project site is within the jurisdiction of the San Joaquin Valley United Air Pollution Control District (SJVUAPCD). Using data on average concentrations of toxic pollutants measured at air monitoring sites, the health risk from existing pollutant exposures can be evaluated. For the toxic pollutants of specific concern in this analysis, the numerical cancer risk from such existing, or background exposures can be estimated. The nearest monitoring data to the proposed project area is in Fresno, approximately 100 miles from the project site. Based on the measured 2000 levels, the California Air resources Board (CARB 2001) estimated the theoretical air toxics-related background cancer risk for the project area as approximately 225 in a million. This risk

estimate can be compared with the normal background lifetime cancer risk (from all cancer causes) of one in four, or 250,000 in a million, as will be noted later.

According to available information, the pollutants, 1,3-butadiene and benzene (emitted primarily from mobile sources) contributed the most to this air toxics-related background risk, accounting together for over one half of the total. The risk from 1,3-butadiene by itself was estimated as 73 in a million, while the risk from benzene was about 68 in a million. Formaldehyde-related risk was estimated as 26 in a million, accounting for approximately 12 percent of the total. Formaldehyde is emitted directly from vehicles and other combustion sources such as the proposed WEC.

The use of reformulated gasoline, beginning in the second quarter of 1996, as well as other toxics reduction measures, have led to a decrease in ambient levels of air toxics and associated cancer risk during the past few years. For example, at the Fresno monitoring station, the related cancer risk was estimated as 497 in a million from 1991 measurement data and 314 in one million from 1995 data. The potential risk from WEC and similar sources should best be assessed in the context of their potential addition to these background risk levels.

IMPACTS

POTENTIAL IMPACTS OF PROJECT'S NON-CRITERIA POLLUTANTS

The health impacts of WEC's non-criteria pollutants of specific concern in this analysis can be assessed separately as construction-phase impacts and operational-phase impacts.

Construction Phase Impacts

Possible construction-phase health impacts, as noted by the applicant (TID 2002a, pages 8.1-56, and Appendix 8.1D), are those from human exposure to (a) the windblown dust from site excavation, and grading, and (b) emissions from construction-related equipment. The dust-related impacts may derive from exposure to the dust itself as PM10, or exposure to any toxic contaminants that might be adsorbed on to it. Since, as more fully discussed in the **Waste Management** Section, the results from the Phases I and II Environmental Site Assessments for the proposed site (TID 2002a, page 8.13-4, and Appendix 8.13B) did not identify any significant contamination, staff does not expect a significant health risk from soil-bound contaminants in the construction phase. The only soil-related construction impacts of potential significance would derive from the possible impacts of PM10 as a criteria pollutant. As mentioned earlier, the potential for significant impacts from criteria pollutants is assessed in the **Air Quality** section.

The exhaust from diesel-fueled construction and other equipment has been established as a potent human carcinogen. Thus, construction-related emission levels should be regarded as possibly adding to the carcinogenic risk of specific concern in this analysis. Appendix 8.1D presents the diesel emissions from the different types of equipment to be used in the construction phase. The maximum theoretical cancer risk from the use of diesel-fueled equipment for WEC's construction was calculated by **Air Quality** staff to

be 21 in a million for the maximum impact location near the project property line. The potential risk at the nearest residences, more than 200 meters from the property lines, was calculated as five in a million (WEC 2002a, Appendix 8.1-D). This cancer risk for the residential area is less than the previously noted staff's significance criterion of 10 in a million.

Operational Impacts

The emissions sources at the proposed WEC include two combustion turbines with heat recovery steam generators, a fire pump diesel engine, and a five-cell mechanical draft cooling tower.

During operation, potential public health risks are related to diesel exhaust emissions from testing the fire pump diesel engine, natural gas combustion emissions from the gas turbines, and noncombustion emissions from the cooling tower. In addition to the toxic substances emitted from the cooling towers, there is a concern that bacterial growth in the cooling water could lead to potential health effects from disease. This is discussed below in the section on Cooling Tower Risk and Legionnaires' Disease.

Public Health Table 1 lists toxic emissions and shows how each contributes to the health risk analysis. For example, the first row shows that oral exposure to acetaldehyde is not of concern but, if inhaled, may have cancer and chronic (long-term) noncancer health effects, but not acute (short-term) effects.

As noted in a publication by the South Coast AQMD (SCAQMD 2000, page 6), one property that distinguishes the air toxics of concern in this analysis from the criteria pollutants is that the impacts from air toxics tend to be highest in close proximity to the source and quickly drop off with distance. This means that the levels of WEC's air toxics would be highest in the immediate area and would decrease rapidly with distance. One main focus of this analysis, as previously noted, is to establish whether or not such exposures would be at levels of possible health significance as established using existing assessment methods.

The applicant's estimates of the WEC's potential contribution to the area's carcinogenic and non-carcinogenic pollutants were obtained from a screening-level health risk assessment conducted according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines. The results from this assessment (summarized in staff's **Public Health Table 2**) were provided to staff along with documentation of the assumptions used (CH2MHill 2003b), WEC 2002a, pages 8.1-39, 8.6-5, 8.1-54 through 8.1-57, pages 8.6-5 through 8.6-4 through 8.6-8 and Appendices 8.1-C and 8.1- D). This documentation included:

- 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 acceptable and has validated the applicant's findings with regard to the numerical public health risk estimates expressed either in terms of the hazard index for each non-carcinogenic pollutant, or a cancer risk for estimated levels of the carcinogenic pollutants. These analyses were conducted to establish the maximum 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.

Public Health Table 1
Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions

Substance	Oral Cancer	Oral Non-cancer	Inhalation Cancer	Non-cancer (Chronic)	Non-cancer (Acute)
Acetaldehyde			✔	✔	
Acrolein				✔	✔
Ammonia				✔	✔
Arsenic	✔	✔	✔	✔	✔
Benzene			✔	✔	✔
1,3-Butadiene			✔	✔	
Cadmium		✔	✔	✔	
Chromium			✔	✔	
Copper				✔	✔
Ethylbenzene				✔	
Formaldehyde			✔	✔	✔
Hexane				✔	
Lead	✔	✔	✔	✔	
Mercury		✔		✔	✔
Napthalene		✔		✔	
Nickel			✔	✔	✔
Polynuclear Aromatic Hydrocarbons (PAHs)	✔	✔	✔	✔	
Propylene				✔	
Propylene oxide			✔	✔	✔
Toluene				✔	✔
Xylene				✔	✔
Zinc				✔	

Source: Prepared by staff using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993 and SRP 1998.

As shown in **Public Health Table 2**, the chronic hazard index for the maximally exposed individual is 0.02 while the maximum hazard index for acute effects is 0.048. These values are well below staff's significance criteria, suggesting that the pollutants in questions are unlikely to pose a significant risk of chronic or acute health effects anywhere in the project area.

Public Health Table 2
Operation Hazard/Risk

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
ACUTE NONCANCER	0.048	1.0	No
CHRONIC NONCANCER	0.02	1.0	No
INDIVIDUAL CANCER	2.81×10^{-6}	10.0×10^{-6}	No

Staff's summary of information from CH2MHill 2003b, and TID 2002 page 8.1-56 and pages 8.6-6, 8.6-7, and 8.6-59 through 8.6-8.

The cancer risk to the maximally exposed individual is shown as 2.81 in a million. Virtually all the risk (2.75 in a million) is from the project's diesel fire pump. The two turbines contribute 0.03 in a million, with an additional 0.02 in a million contributed by the cooling tower. This calculated total risk is well below staff's significance criterion for this screening level assessment, thus showing that any project-related cancer risk would be insignificant for all the individuals in the project area. Staff notes that the maximum risks from the turbines, fire pump, and cooling towers all occur in different locations, so a total risk that includes all three sources results in a conservative calculation.

The conservatism in the cancer risk calculation is also reflected in the previously noted fact that (a) the individual considered is assumed to be exposed at the highest possible levels to all the carcinogenic pollutants from the project for a 70-year lifetime, (b) all the carcinogens are assumed to be equally potent in humans and experimental animals, even when their cancer-inducing abilities have not been established in humans, and (c) humans are assumed to be as susceptible as the most sensitive experimental animal, despite knowledge that cancer potencies often differ between humans and experimental animals. Only a relatively few of the many environmental chemicals identified so far as capable of inducing cancer in animals have been shown to also cause cancer in humans.

Cooling Tower-Related Risk of Legionnaire's Disease

Any project-related risk of the previously noted Legionnaires' disease or Legionellosis would result from inhalation exposure to the causative agent, Legionella pneumophila, a bacterium that is common in the general environment. According to the available literature, any significant risk of specific outbreaks is related to uncontrolled growth in standing water together with exposure at an infective dose, which differs according to the individual's susceptibility to microbial infection in general. The available information shows that most outbreaks in the United States occur in cases of either high-level exposure from uncontrolled growth and multiplication in inadequately treated cooling

system water, or relatively low-level exposure to individuals with reduced resistance to microbial infections. Such individuals are most commonly found in hospitals, nursing homes or other institutions with individuals with weak immune systems. Outbreaks are most commonly associated with microbial growth-enhancing conditions in commercial building heating, ventilating, and air conditioning (HVAC) systems, but are possible from growth in industrial cooling towers. The main risk from WEC and similar sources is the possibility of Legionella emission and transport into the surrounding areas where related disease outbreaks may be primary (that is from direct inhalation of the emitted organism) or secondary (being to secondary growth and multiplication in microbial growth-facilitating environments).

The U.S. EPA has published a review of the Legionellosis issue in an criteria document (EPA 1999) where it noted that Legionella's survival is enhanced by symbiotic interactions with other microorganisms in cases of nutrient availability. Its dispersion after growth and multiplication could occur from being transported within the aerosols or water droplets from the source in question. The available information has shown that outbreaks most commonly result from growth and multiplication in cooling towers and evaporative condensers in hospitals, hotels, and public buildings, thus, establishing these sources as suitable habitats for the bacterium. Kool et al (2000) reported that Legionella was detected in water systems of 11 of 12 hospitals examined in San Antonio, TX. They found, interestingly, that the number of Legionnellosis cases in each of these hospitals was better correlated with the proportion of water-system sites that tested positive for Legionella than with the concentration of the bacterium in water systems. This suggests that outbreaks may not always be related to excessively high Legionella concentration in the system waters involved. While most outbreaks have resulted from indoor exposure, the U.S. EPA has established that they are also possible from outdoor exposures at distances of up to 200 meters from the source the bacterium.

The U.S. EPA has inadequate quantitative data on the infectivity of Legionella in humans to prepare a dose-response evaluation. Therefore, sufficient information is not available to support a quantitative characterization of the threshold infective dose of Legionella. Thus, the presence of even small numbers of Legionella bacteria presents a risk - however small - of disease in humans. The victims of Legionella are those who are in some way immuno-compromised (hospital patients, drug users, alcoholics, some of the elderly etc.). Normally functioning immune systems would have antibodies to Legionella and would be able to defend against Legionella infection.

The U.S. EPA has also published a Legionella Drinking Water Health Advisory (EPA 2001) noting that there are several control methods for ensuring the cooling system water disinfections known to be effective against uncontrolled Legionella growth and multiplication. This disinfection procedure might involve back flushing, hyperchlorination, copper-silver ionization, ultraviolet light-based sterilization, ozonation, and steam-based sterilization. The State of California regulates recycled water that is used for cooling towers operations according to requirements in Title 22, Section 60303, California Code of Regulations. These requirements require the use of chlorine or another biocides to an extent necessary for adequate sterilization against Legionella and other microorganisms.

The appropriateness of staff's concern for this project is reflected in the reports of Addiss, David, et al. (1989), and Bhopal et al (1991) who linked the outbreak of Legionellosis around

specific cooling towers to failure to properly disinfect the utilized water. Since the conditions that facilitate the requisite growth and multiplication are well established, all current preventive measures are aimed at factors that prevent such conditions. However, such control efforts might be hampered when there growth of bio-film that affects the bactericidal action of the biocides used. This means that the biocides that may be effective against other common bacteria may not be relied upon to effectively control Legionella survival and growth.

As noted in the available literature, cooling tower drift eliminators usually serve to minimize the widespread transport of the aerosols or droplets containing the bacterium, thereby limiting the risk of disease-inducing exposure. Since specific nutrients are necessary for Legionella growth, effective mitigation measures should include a cleaning and maintenance program to minimize the accumulation of needed nutrients. The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE 1998) emphasizes the need for such programs in its specifications for Legionellosis prevention. Preventive maintenance in this regard include having effective drift eliminators, periodically cleaning the system as appropriate, maintaining mechanical components in working order, and maintaining an effective water treatment program with appropriate biocide concentrations. Staff notes that most water treatment programs are designed to minimize scale, corrosion, and biofouling and not necessarily to control Legionella. Staff's recommended Condition of Certification **Public Health-1** is intended to ensure the effective maintenance and bactericidal action necessary during the operation of WEC's cooling tower.

In assessing the appropriateness of the proposed Conditions of Certification, staff would note, as an example, that the County of San Diego Department of Environmental Health (2001) recommends that when using recycled water in cooling towers, drift eliminators and a chorine or other biocide should be used to treat the cooling system water to minimize growth of Legionella and other microorganisms. Although Legionella is not specifically regulated by either the San Diego Air Pollution Control District nor or the Bay Area Air Quality Management District (BAAQMD), BAAQMD's regulations include suggestions to follow guidelines and recommendations made by the Cooling Technology Institute in their February 2000 report titled "Legionellosis, Guideline: Best Practices for Control of Legionella" which can be found at the following web page: (http://www.baaqmd.gov/permit/handbook/s11c11pd.htm

The following ASHRAE control strategies (ASHRAE 1998 and 2000) are specifically intended to minimize the growth and multiplication at the root of the modern Legionella problem in potential problem sources:

- Avoid piping that is capped and with restricted water flow (dead legs).
- Control the input water temperature to avoid temperature ranges where Legionella grow best. The temperature of cold water should be kept below 25° C (77° F) and hot water above 55° C (131° F).
- Apply biocide in accordance with label specifications necessary to control the growth of other bacteria, algae, and protozoa that may contribute to nutritional needs of Legionella. Different anti-microbial approaches should be applied at specific intervals. These should include thermal shocks, oxidizing biocides, chlorine-based oxidants and ozone treatment.

- Conduct routine periodic “back-flushes” to remove bio-film buildup on the inside walls of the pipes.

Staff’s recommended requirements are specifically intended to minimize Legionella growth through common antibacterial measures. This condition would specifically require the project owner to prepare and implement a biocide and anti-biofilm agent monitoring program to ensure that proper levels of biocide and other agents are maintained within the cooling tower water at all times, that periodic measurements of Legionella levels are conducted, and that periodic cleaning is conducted to remove bio-film buildup. Staff believes that with the use of an aggressive antibacterial program, coupled with routine monitoring and biofilm removal, the chances of Legionella growth and dispersal would be reduced to insignificance.

CUMULATIVE IMPACTS

As previously noted, the maximum impact location would be the spot where pollutant concentrations for the proposed WEC would theoretically be highest. Even at this location, staff does not expect any significant change in lifetime risk to any person, given the calculated incremental cancer risk of 2.81 in one million which staff regards as not potentially contributing significantly to the previously noted average lifetime individual cancer risk of 250,000 in one million. Modeled facility-related residential risks are much lower for more distant locations. Given the previously noted conservatism in the utilized calculation method, the actual risks would likely be much smaller. Therefore, staff does not consider the incremental impact of the additional risk posed by operation of WEC as pointing to a potentially significant contribution to the area’s cancer risk.

As noted previously, the applicant’s modeling analysis for construction impacts points to a potentially significant health impact, but **Air Quality** staff has remodeled such impacts using more appropriate assumptions. The risk level at the nearest residence estimated by staff was less than the significance level of ten in one million.

The worst-case long-term non-cancer health impact from the project (represented as a chronic hazard index of 0.02) is well below staff’s significance level of 1.0 at the location of maximum impact. At this level, staff does not expect any cumulative health impacts to be significant. As with cancer risk, long-term hazard would be lower at all other locations and cumulative impacts at other locations would also be less than significant.

ENVIRONMENTAL JUSTICE

Staff has reviewed the Census 2000 information that shows the minority population as less than 50 percent within a six-mile radius of the proposed Walnut Energy Center (please refer to **Socioeconomics Table 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff considers these to be pockets or clusters. Staff also reviewed Census 2000 information that shows the low-income population as less than 50 percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff conducted a focused environmental justice analysis with respect to transmission line safety and nuisance.

Based on staff's public health analysis, which included consideration of information provided by participants at workshops, staff has identified a potential unmitigated, significant direct impacts resulting from construction of the project. As noted previously, public health staff will analyze additional construction modeling and has not yet made a final determination regarding significance.

COMPLIANCE WITH LORS

Since the cancer and non-cancer risks from WEC operation reflect the effectiveness of the control measures (including an oxidation catalyst which reduces hazardous air pollutant emissions) proposed by the applicant or required by the applicable LORS, staff concludes that the proposed operational plan would comply with these LORS. As noted above, the final determination of the potential significance of construction impacts is not yet complete.

FACILITY CLOSURE

As noted in the introduction section, the toxic pollutants of primary concern in this analysis are those from routine operation of the proposed project. During temporary or permanent closure, the main concern would be over the non-routine releases of hazardous materials or wastes on site. Such releases are discussed respectively in the **Hazardous Materials** and **Waste Management** sections of this staff assessment. During temporary closure (periods greater than those required for normal maintenance), it is unlikely that there would be any routine releases of harmful substances to the environment, since the facility would not be operating. During permanent closure, the only emissions of potential significance would derive from demolition or dismantling activities and the equipment used. Such emissions would be subject to controls according to requirements in conditions adopted by the Energy Commission after a closure plan is received from the project owner.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that the toxic air emissions from the operation of the proposed natural gas-burning WEC are at levels that do not require mitigation beyond that already proposed by the applicant. The conditions for ensuring compliance with all applicable air quality standards are specified in the **Air Quality** section for the area's problem criteria pollutants. Implementation of staff's proposed condition of certification to reduce the likelihood of Legionella growth would ensure that the risk of Legionella growth and dispersion is reduced to levels of insignificance.

If the proposed project is approved, staff recommends the following Condition of Certification to address the Legionella problem of concern for the cooling tower

PROPOSED CONDITION OF CERTIFICATION

Public Health-1 The project owner shall develop and implement a cooling tower Biocide Use, Bio-film Prevention, and Legionella Monitoring Program to ensure that the potential

for bacterial growth is kept to a minimum. This Program shall include monitoring of biocide and chemical bio-film prevention agents, periodic maintenance of the cooling water system to remove bio-film buildup, and testing to determine the concentrations of the Legionella bacterium in the cooling water,

Verification: At least 60 days prior to the commencement of cooling tower operations, the Biocide Use, Biofilm Prevention, and Legionella Monitoring Program shall be provided to the CPM for review and approval.

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ATTACHMENT A - CRITERIA POLLUTANTS

OZONE (O_3)

Ozone is not directly emitted from specific sources but is formed when reactive organic compounds (VOCs) interact with nitrogen oxides in the presence of sunlight. Heat speeds up the reaction, typically leading to higher concentrations in the relatively hot summer months. Ozone is a colorless, reactive gas with oxidative properties that allow for tissue damage in the exposed individual. The effects of such damage could be experienced as respiratory irritation that could interfere with normal respiratory function. Ozone can also damage plants and other materials susceptible to oxidative damage.

The U.S. EPA revised its federal ozone standard on July 18, 1997 (62 Fed. Reg. 38856), based on health studies that had became available since the standard was last revised in 1979. These new studies showed that adverse health effects could occur at ambient concentrations much lower than reflected in the previous standard, which was based on acute health effects experienced during heavy exercise. In proposing the new standard, the EPA identified specific health effects known to have been caused by short-term exposures (of one to three hours) and prolonged exposure (of six to eight hours) (61 Fed. Reg. 65719). However, a 1999 federal court ruling blocked implementation of the ozone 8-hour standard, which is yet to be implemented.

Acute health effects from short-term exposures include a transient reduction in pulmonary function, and transient respiratory symptoms including cough, throat irritation, chest pain, nausea, and shortness of breath with associated effects on exercise performance. Other health effects of short-term or prolonged O_3 exposures include increased airway responsiveness (which predisposes the individual to bronchoconstriction induced by external stimuli such as pollen and dust), susceptibility to respiratory infection (through impairment of lung defense mechanisms), increased hospital admissions and emergency room visits, and transient pulmonary inflammation.

Generally, groups considered especially sensitive to the effects of air pollution include persons with existing respiratory diseases, children, pregnant women, and the elderly. However, controlled exposure data on people in clinical settings have indicated that the population at greatest risk of acute effects from ozone exposures as children and adults engaged in physical exercise. Children are most at risk because they are active outside, playing and exercising, during summer when ozone levels are highest. Adults who are outdoors and engaging in heavy exertion in the summer months are also among the individuals most at risk. This happens because such exertion increases the amount of O_3 entering the airways and can cause O_3 to penetrate to peripheral regions of the lung where lung tissue is more likely to be damaged. These individuals, as well as those with respiratory illnesses, such as asthma, can experience a reduction in lung function and increased respiratory symptoms, such as chest pain and cough, when exposed to relatively low ozone levels during periods of moderate exertion.

CARBON MONOXIDE (CO)

Carbon monoxide is a colorless, odorless gas, which is a product of inefficient combustion. It does not persist in the atmosphere, being quickly converted to carbon dioxide. However, it can reach high levels in localized areas, or "hot spots".

CO reduces the oxygen carrying capacity of the blood, thereby disrupting the delivery of oxygen to the body's organs and tissues. Persons sensitive to the effects of carbon monoxide include those whose oxygen supply or delivery is already compromised. Thus, groups potentially at risk to carbon monoxide exposure include persons with coronary artery disease, congestive heart failure, obstructive lung disease, vascular disease, and anemia, the elderly, newborn infants, and fetuses (CARB 1989, p. 9). In particular, people with coronary artery disease were found to be especially at risk from carbon monoxide exposure (CARB 1989, p. 9). Tests conducted on patients with confirmed coronary artery disease indicated that exposure to low levels of carbon monoxide during exercise can produce significant cardiac effects. These effects include chest pain (angina) and electrocardiographic changes indicative of effects on the heart muscle (CARB 1989, p. 6). Such changes can limit the ability of patients with coronary artery disease to exert themselves even moderately. Therefore, the statewide carbon monoxide one-hour and eight-hour standards were adopted in part to prevent aggravation of chest pain. Additionally, however, the standards are intended to prevent decreased exercise tolerance in persons with peripheral vascular disease and lung disease, impaired central nervous system functions, and effects on the fetus (Cal. Code Regs. Tit. 17, sec. 70200).

PARTICULATE MATTER (PM)

Particulate matter is a generic term for particles of various substances, which occur as either liquid droplets or small solids of a wide range of sizes. Particles with the most potential to adversely affect human health are those less than 10 micrometers (millionths of a meter) in diameter (known as PM10), which may be inhaled and deposited within the deep portions of the lung (PM10). PM may originate from anthropogenic or natural sources such as stationary or mobile combustion sources or windblown dust. Particles may be emitted directly to the atmosphere or result from the physical and chemical transformation of gaseous emissions such as sulfur oxides, nitrogen oxides, and volatile organic compounds. PM10 may be made up of elements such as carbon, lead, and nickel; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust and soil fragments. The size, chemical composition, and concentration of ambient PM10 can vary considerably from area to area and from season to season within the same area.

PM10 can be grouped into two general sizes of particles, fine and coarse, which differ in formation mechanisms, chemical composition, sources, and potential health effects. Fine-mode particles are those with a diameter of 2.5 micrometers or less (PM2.5), while the coarse-mode fraction of PM consists of particles ranging from 10 micrometers down to 2.5 micrometers in diameter.

Coarse-mode PM10 is formed by crushing, grinding, and abrasion of surfaces, and in the course of reducing large pieces of materials to smaller pieces. Coarse particles consist mainly of soil dust containing oxides of silicon, aluminum, calcium, and iron; as

well as fly ash, particles from tires, pollen, spores, and plant and insect fragments. Coarse particles normally have shorter lifetimes (minutes to hours) and only travel over short distances (of less than tens of kilometers). They tend to be unevenly distributed across urban areas and have more localized effects than the finer particles.

PM2.5 is derived both from combustion by-products, which have volatilized and condensed to form primary PM2.5, and from precursor gases reacting in the atmosphere to form secondary PM2.5. Components include nitrates, organic compounds, sulfates, ammonium compounds, and trace elements (including metals) as well as elemental carbon such as soot. Major sources of PM2.5 are fossil fuel combustion by electric utilities, industry and motor vehicles, vegetation burning, and the smelting or other processing of metals. Dry deposition of fine mode particles is slow allowing such particles to often exist for long periods of time (of from days to weeks) in the atmosphere and travel hundreds to thousands of kilometers. They tend to be uniformly distributed over urban areas and larger regions and are removed from the atmosphere primarily by forming cloud droplets and falling out within raindrops.

The health effects of PM10 from any given source usually depend on the toxicity of its constituent pollutants. The size of the inhaled material usually determines where it is deposited in the respiratory system. Coarse particles are deposited most readily in the nose and throat area while the finer particles are more likely to be deposited within the bronchial tubes and air sacs, with the greatest percentage deposited in the air sacs. Until recently, PM10 particles had been considered to be the major fraction of airborne particulates responsible for various adverse health effects. The PM10 fraction is known to be capable of penetrating the thoracic and alveolar regions of the human and animal lungs. The PM2.5 fraction, however, was found to pose a significantly higher risk for health. This is due to their size and associated deposition and retention characteristics in the respiratory tract, enabling it to penetrate and deposit within the deeper alveolar regions of the lung. The following aspects of PM2.5 deposition all contribute to the more serious health effects attributed to smaller particles:

- The deposition of PM2.5 favors the periphery of the lungs, which is especially vulnerable to injury for anatomical reasons.
- Clearance of the PM2.5 from within the deeper reaches of the lungs is a much slower process than from the upper regions. Consequently, the residence time is longer, implying longer exposure, and hence greater risk.
- The human anatomy further allows the penetration of the superficial tissues by PM2.5 and entry into the bodily circulation without much effort in the periphery of the lungs.

Many epidemiological studies have shown exposure to particulate matter capable of inducing a variety of health effects, including premature death, aggravation of respiratory and cardiovascular disease, changes in lung function and increases in existing respiratory symptoms, effects on lung tissue structure, and impacts on the body’s respiratory defense mechanisms. The underlying biological mechanisms are still poorly understood. Based on their review of a number of these epidemiological studies (as published after 1987 when the federal standards were revised), together with suggestion of PM2.5 concentrations as a more reliable surrogate for the health impacts

of the finer fraction of PM than PM10, the U.S. EPA concluded that the then-current standards were not sufficiently stringent to protect against significant effects in exposed humans. Therefore, federal PM standards were revised on July 18, 1997 (62 Fed. Reg. 38652) to add new annual and 24-hour PM2.5 standards to the existing annual and 24-hour PM10 standards. Taken together, these new standards were meant to provide additional protection against a wide range of PM-related health effects, including premature death, increased hospital admissions and emergency room visits, primarily among sensitive individuals such as the elderly, children and individuals with cardiopulmonary diseases such as asthma. Other impacts include decreased lung function (particularly in children and asthmatics), and alterations in lung tissue and structure.

California has also had 24-hour and annual standards for PM10 (CARB 1982, pp. 81, 84). These studies were aimed at establishing the PM10 levels capable of inducing asthma, premature death and bronchitis-related symptoms. They were set to protect against such impacts in the general population as well as sensitive individuals such as patients with respiratory disease, declines in pulmonary function, especially as related to children (Tit. 17, Cal. Code Regs., §70200). These standards were set to be more stringent than the federal standard, which the ARB regarded as inadequate for the protection desired (CARB 1991, p. 26).

On June 20, 2002, the ARB approved the adoption of a lower annual state standard for PM10, as well as a new annual standard for PM2.5 (CARB 2002). The 24-hour PM10 standard was not changed. The standards were established to prevent excess death, illnesses such as respiratory symptoms, bronchitis, asthma exacerbation, and cardiac disease, and restrictions in activity from short- and long-term exposures (Title 17, Cal. Code Regs., §70200).

NITROGEN DIOXIDE (NO_2)

Nitrogen dioxide is formed either directly or indirectly when oxygen and nitrogen in the air combine together during the combustion. It is a relatively insoluble gas, which can penetrate deep into the lungs, its principal site of toxicity. Its toxicity is thought to be due to its capacity to initiate free radical-mediated reactions while oxidizing cellular proteins and other biomolecules (CARB 1992, Appendix A, p. 4).

Sub lethal exposures in animals usually produce inflammations and varying degrees of tissue injury characteristic of oxidant damage (Evans in CARB 1992, Appendix A, and p 5). The changes produced by low-level acute or sub chronic exposures appear to be reversible when the animal study subject is allowed to recover in clean air.
Health effects of particular concern in relation to low-level nitrogen dioxide exposure include: (1) effects of acute exposure on some asthmatics and possibly on some persons with chronic bronchitis, (2) effects on respiratory tract defenses against infection, (3) effects on the immune system, (4) initiation or facilitation of the development of chronic lung disease, and (5) interaction with other pollutants (CARB 1992, Appendix A, p. 5).

Several groups, which may be especially susceptible to nitrogen dioxide-related health effects have been identified from human studies (CARB 1992, Appendix A, and p. 3).

These include asthmatics, persons with chronic bronchitis, infants and young children, cystic fibrosis and cancer patients, people with immune deficiencies, and the elderly.

Studies involving brief, controlled exposures on sensitive individuals have shown an increase in bronchial reactivity or airway responsiveness of some asthmatics, as well as decreased lung function in some patients with chronic obstructive lung disease (CARB 1992, Appendix A, p. 2). In general, bronchial hyper reactivity (an increased tendency of the airways to constrict) is markedly greater in asthmatics than in non-asthmatics upon exposure to initiating respiratory irritants (CARB 1992a, p. 107). At exposure concentrations of specific relevance to the current one-hour ambient standard, there appears to be little, if any, effect on respiratory symptoms of asthmatics (CARB 1992a, p. 108).

SULFUR DIOXIDE (SO_2)

Sulfur dioxide is formed when any sulfur-containing fuel is burned. SO_2 is highly soluble and consequently absorbed in the moist passages of the upper respiratory system. Exposure to sulfur dioxide can lead to changes in lung cell structure and function that adversely affect a major lung defense mechanism known as muco-ciliary transport. This mechanism functions by trapping particles in mucus in the lung and sweeping them out via the cilia (fine hair-like structures) also in the lung. Slowed mucociliary transport is frequently associated with chronic bronchitis.

Exposure to sulfur dioxide can produce both short- and long-term health effects. Therefore, California has established sulfur dioxide standards to reflect both short- and long-term exposure concerns. Based on controlled exposure studies of human volunteers, investigators have found that asthmatics comprise the group most susceptible to adverse health effects from exposure to sulfur dioxide (CARB 1994, p. V-1).

The primary short-term effect is bronchoconstriction, a narrowing of the airways, which results in labored breathing, wheezing, and coughing. The short-term (one-hour) standard is based on bronchoconstriction and associated symptoms (such as wheezing and shortness of breath) in asthmatics and is designed to protect against adverse effects from five to ten minute exposures. In the opinion of the California Office of Environmental Health Hazard Assessment, the short-term ambient standard is likely to afford adequate protection to asthmatics engaged in short periods of vigorous activity (CARB 1994, Appendix A, p. 16).

Longer-term exposure is associated with increased incidence of respiratory symptoms (such as coughing and wheezing) or respiratory disease, decreases in pulmonary function, and an increased risk of premature mortality (CARB 1991a, p. 12). The long-term (24-hour) standard is based upon increased incidence of respiratory disease and premature mortality. The standard includes a margin of safety based on epidemiological studies, which have shown adverse respiratory effects at levels slightly above the standard. Some of the studies indicate a sulfur dioxide threshold for effects, suggesting that no significant effects are expected from exposures to concentrations at the state standard (Ibid.).

ATTACHMENT A - REFERENCES

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SOCIOECONOMICS

Joseph Diamond, Ph.D.

INTRODUCTION

California Energy Commission (Energy Commission) staff socioeconomic impact analysis evaluates the project induced changes on community services and/or infrastructure and related community issues such as Environmental Justice (EJ) and facility closure. Direct, indirect, induced, and cumulative impacts are also included. Staff discusses the estimated impacts of the construction and operation of the Turlock Irrigation District (TID) Walnut Energy Center (WEC) project on local communities, community resources, and public services, pursuant to Title 14, California Code of Regulations, Section 15131. The WEC project power plant, transmission line, and natural gas pipeline will be owned, and operated by TID, a public agency.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

California Government Code, section 65996-65997 places levies against development projects near school districts. As amended by SB 50 (Stats. 1998, ch. 407, Sec. 23), it states that public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

ENVIRONMENTAL SETTING

The WEC is located at the western edge of Turlock, Stanislaus County away from the downtown area. The study area (affected area), defined by the WEC project in the AFC and by staff is Stanislaus County.[1] Stanislaus County, and its major cities Modesto and Turlock, are within a one-hour one-way commute distance of the power plant site, an area in which construction and operations workers may live. This area may also include Merced, Mariposa, and Tuolumne Counties. The applicant and staff utilized the Stanislaus County labor market area for its evaluation of construction and operation worker availability and community services and infrastructure impacts from construction and operation. Stanislaus County was used as the study area in identifying non-fiscal (private sector) benefits from the WEC.

ANALYSIS AND IMPACTS

Staff reviewed the WEC AFC, Vol. I, November 18, 2002 Socioeconomic section and socioeconomic data adequacy responses (TID 2002a&b). Based on staff's use of the socioeconomic data provided and referenced from governmental agencies, trade associations and staff's independent analysis, staff agrees with the applicant's socioeconomic analysis and conclusions.

[1] The environmental and economic impacts are based on using Stanislaus County as the study area because it is most likely to be impacted by the project .

This staff analysis uses fixed percentage criteria for housing and environmental justice (EJ) in the evaluation of potential impacts. For housing, staff uses a vacancy rate of five percent or less of permanent available housing, and for EJ, staff uses a threshold of greater than 50 percent for minority/low-income population in the affected area. Criteria for subject areas such as fire protection, water supply and wastewater disposal are analyzed in other sections of this staff assessment. Educational impacts are subjectively determined but are moot, as described later in the testimony. Impacts on medical services, law enforcement, or community cohesion are based on subjective judgements or input from local and state agencies. Typically, greater non-local employment has the potential to result in significant impacts.

EMPLOYMENT AND ECONOMY

According to the WEC AFC and its Data Adequacy Supplement, all pertinent crafts will come from Stanislaus and Merced County though WEC could draw on Mariposa and Tuolumne Counties as well. Most of the operational workforce is expected to come from Stanislaus County (TID 2002a&b).

The average commute time is defined as distances that involve up to a one-hour, one-way commute for construction and operations employees. However, construction workers generally commute as much as two hours (one-way). This defines the local labor market. Construction workers who live in communities at greater distances than a two-hour one-way commute tend to relocate to the project area for the work week, then return home on the weekend. Operations workers tend to live within a one-hour, one-way commute, and if they live outside this area, they would likely relocate. The “non-local” workers for the WEC project will represent 40 percent of the construction workforce and a small percentage for operations.

Staff’s analysis agrees with the applicant that the assumption of non-local workers is conservative based on past experience with similar projects. Also, based on the data presented in Subsections 8.8.4.3.1 and 8.8.4.3.1 including Table 8.8-14 (Available Labor by Skill in Stanislaus County, 1999 to 2006) of the AFC, and according to the California Employment Development Department and conversations with local labor unions, there is adequate workforce in Stanislaus County to meet the WEC project’s labor force needs (TID 2002b).

The following **Socioeconomics Table 1** shows that available labor, by skill, in Stanislaus County is considerable when compared to the to WEC project needs.

SOCIOECONOMICS Table 1
Available Labor by Skill for Construction*

Occupational Title	Annual Averages 1999	2006	Maximum (Monthly) Number Of Workers Needed For The Project (includes power plant, water pipeline, natural gas pipeline, and transmission lines)
Carpenters	1,200	1,470	2
Masons	390	470	2
Painters	370	450	6
(Structural) Metal Workers	110	130	-
Electricians	760	910	34
Welders	630	770	-
Excavators	70	100	-
Graders	80	100	-
Industrial Truck Operators	2,350	2,730	56
Operating Engineers	190	220	21
Helpers, Laborers	7,010	8,020	26
Pipefitters	360	430	45
Administrative Services Managers	260	290	-
Mechanical Engineers	80	90	-
Electrical Engineers	70	90	-
Engineering Technicians	660	730	-
Plant and System Operators	490	550	-
Insulation Workers	-	-	15
Iron Workers	-	-	16
Millwrights	50	60	24
Sheetmetal Workers	250	300	4
Surveyors	-	-	4

* Source:California Employment Department, Labor Market Information and 2002. TID, AFC (Table 8.8-12), 2002.

Stanislaus County has a fairly large workforce of 164,900 as of 2001 (TID 2002a). Furthermore, the mining and construction workforce has been growing at an average annual rate of 11.5 percent per year from 1998-2001 (TID 2002a). Therefore, peak construction activity for the WEC represents about 2.5 percent of the 2001 workforce for the mining and construction sectors.

The Impact Analysis For Planning (IMPLAN) model (an input-output model), used by the applicant to estimate employment impacts from the WEC Project on the affected area, is widely used and acceptable to staff. The University of California at Berkeley uses the IMPLAN model for regional economic assessment, and it has been used to assess other generating projects in California and the U.S. It is a common regional economic tool. In general, most multipliers are estimated by showing the total change divided by

the initial change. Employment multipliers refer to the total additional employment stimulated by the new economic activity. IMPLAN is a disaggregated type of model that divides the (regional) economy into sectors and provides a multiplier for each sector (Lewis et al. 1979). Social Accounting Matrix (SAM)[2] multipliers were used for the applicant's economic impact analysis. SAM multipliers are similar to Type II multipliers because they include both the indirect and induced effects (secondary impacts). An IMPLAN SAM variety employment multiplier of 1.7 was used for construction (e.g., the 124 new construction job's income supports approximately 88 indirect and induced jobs in the regional economy for a total of 212 jobs)[3] . An IMPLAN SAM variety employment multiplier of 3.1 was used for operations indicating that the 21 direct jobs support approximately 44 indirect and induced jobs in the regional economy, resulting in a total of 65 jobs. An IMPLAN SAM variety construction income multiplier of 1.2 was used that resulted in a secondary impact of $2,017,184 and a total impact of $11,808,784. Finally, an IMPLAN SAM variety operation income multiplier of 1.2 was used that resulted in a secondary impact of $1,366,965 million and a total impact of $8,468,960 (TID 2002a).[4] These multipliers are within an acceptable range of two to three (Moss et al. 1994), therefore, staff considers these projected beneficial economic impacts to be reasonable.

Project construction (power generation including the natural gas pipeline and electric power transmission) is expected to occur over a 24-month period. The greatest number of construction workers (peak), estimated to be 277 workers will be needed in the 15th month of construction. The number of construction workers will range from five in the last month of construction to approximately 277 workers in the 15th month of construction. These workers will come mainly from the local area.

The unemployment rate for Stanislaus County was 11.5 percent in December 2002, not seasonally adjusted (State of California 2002). This is a substantial level of unemployment that indicates the local availability of some needed workers for construction.

Staff accepts the applicant's estimate that the non-local construction workforce (approximately 40 percent of the total construction workforce or 111) would come from Merced, Mariposa, and Tuolumne Counties. It is unlikely that the workers would bring their families due to the seasonal nature of the work, and it is too speculative to allocate workers to local communities and Stanislaus County (TID 2002b).

During operation of the project, about 21 workers will be needed to maintain and operate the project. Most of the 21 operational workers are expected to come from Stanislaus County, with the remainder coming from neighboring counties such as Merced, Mariposa, and Tuolumne. Staff agrees with the applicant that even if all the operational workers were to be non-local, and relocate to Stanislaus County, that would not have a significant adverse socioeconomic impact on community infrastructure.

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[2] Type SAM multipliers capture inter-institutional transfers and account for social security and income tax leakages, institutional savings, and commuting.

[3] Based on $2 million in local construction expenditures.

[4] All project construction and operations economic estimates are presented in 2002 dollars (TID 2002b).

POPULATION

The project is located within the City of Turlock in Stanislaus County. The 2000 U.S. Census shows California with a total population of 33,871,648, non-white population of 18,054,858 (53.3 percent), and a white (non-Hispanic) population of 15,816,790 or (46.7 percent). For Stanislaus County, the 2000 Census shows a total population of 446,997, non-white population of 190,996 (42.7 percent), and a white (non-Hispanic) population of 256,001 or 51.3 percent. Since 1990, Stanislaus County has been growing faster than the state and this trend is expected to continue through 2015 (TID 2002a). As mentioned under the **Employment** section, the majority of construction and operation labor will be local so there would be little induced population growth from the WEC project. Furthermore, there would be no displacement of population by the WEC project.

HOUSING

According to federal standards, permanent housing is considered to be in short supply if the vacancy rate is less than five percent (URS 2000). As of January 1, 2000, there were approximately 152,023 housing units in Stanislaus County and an additional 18,685 housing units in the City of Turlock (see Table 8.8-6 of the AFC). The vacancy rate for this housing averages approximately five percent for Stanislaus County and 4.61 percent for the City of Turlock. There are about seven hotels/motels with 483 rooms in the City of Turlock and 38 hotel/motels with 2,800 rooms in Stanislaus County. From January 2001 to June 2002, the vacancy rate in Stanislaus County was 35 percent or 1,149 rooms. In addition, there are 10 recreational vehicle (RV) parks within 40 miles of the City of Turlock (TID 2002a). The housing units available to non-local construction workers for this project are sufficient for worker needs. The majority of the construction workforce, and most of the operations work force, is expected to be drawn from the local labor force. Also, non-local construction workers typically stay in hotel/motels or in their trailers in RV parks (TID 2002a).

The WEC project will be located in urban Turlock, Stanislaus County, with no displacement of housing.

FISCAL

The WEC project capital costs are from $160 to $220 million, including $100 million for materials and supplies. The estimated value of materials and supplies that will be purchased locally (within Stanislaus County) during construction is between $2 and $4 million. Sales tax is paid on material and supply expenditures. The sales tax rate of 7.375 percent in Stanislaus County is comprised of the state sales tax rate (six percent), one percent to the place of sale, 0.25 percent to the county and 0.125 percent to special districts. The local sales tax estimated during construction is $147,500 to $295,000 (i.e., 7.375 percent of local sales).

The construction payroll is $26 million. With 60 percent of the workforce residing in Stanislaus County, about $15 million will stay in the area over the two year construction period.

The total payroll for the operation phase is estimated to be $1.3 million annually. The applicant anticipates that approximately $2 million in non-labor purchases (equipment and materials) would occur in the local area. In addition, there is an annual maintenance budget of $3.8 million with local expenditures of $2 million on materials and supplies during operation. The estimated sales tax is $147,500, with one percent ($20,000) to the place of sale.

TID is a public agency and will not pay property taxes.

SCHOOLS

There are 27 elementary, high school, and unified school districts in Stanislaus County. The TID project is in the Turlock School District and Chatom Union Elementary School District. TID, as a public agency, is exempt from paying school impact fees as required by California government Code section 65996-65997.

The applicant states that the schools in the Turlock Unified School District are not considered overcrowded (TID 2002a). Even when there is overcrowding, it is common to bus students to alleviate the problem. The Chatom Union Elementary School District is much smaller in size and also is not overcrowded (Patman 2003).

Staff agrees with the applicant that most non-local construction workers (40 percent or 111 workers for the peak and 50 workers for the average) will probably not bring their families for the 24-month project. During the operations phase, even if all of the 21 operating employees were to relocate and live in Turlock, it would not result in a significant adverse impact. Assuming an average family size of 3.03 (US 2000 Census) this would result in about 21 children added to the local schools. This would result in a less than one-percent increase in enrollment (TID 2002a). Overall, staff expects no significant impact on study area schools.

Education Code section 17620 states that public agencies may not impose fees, charges or other financial requirements to offset the cost for “school facilities.” School facilities are defined as “any school-related consideration relating to a school district’s ability to accommodate enrollment.” Local and state agencies are precluded from imposing (additional) fees or other required payments on development projects for the purpose of mitigating possible enrollment impacts to schools.

POLICE PROTECTION

The AFC (Section 8.8.3.6.1 Law Enforcement) notes that the proposed WEC project will be served by the Turlock Police Department (TPD). The Department has 20 patrol cars and 81 officers. The response time, depending on the traffic, to an emergency at the proposed project site is approximately four minutes (TID 2002a). In addition, the California Highway Patrol (CHP) is the primary law enforcement agency for state highways and roads covering law enforcement, traffic control, and accident investigation. The applicant does not expect the construction or operation phase of the project to have any impact on its ability to serve the rest of the community (TID 2002a). The WEC project would not significantly increase the existing demand for police service or adversely affect police protection in and around the WEC project area. There would

be a small increase in population during the 24 months of construction and during operation, but most of the workforce will be local (TID 2002a&b).

MEDICAL SERVICES/UTILITIES

In the AFC (Section 8.8.3.6.4 Hospitals), three hospitals are described as being available for medical assistance. The Emanuel Medical Center in Turlock has 150 beds and approximately 200 doctors. The estimated response time (project site to hospital) is 12-15 minutes by car, five to six minutes for an emergency ambulance one-way, and eight to ten minutes by helicopter (one-way) in a severe case (Alameida 2003). Second, is Doctors Medical Center in Modesto, which has 397 beds and a staff of approximately 560 doctors. Thirdly, is Memorial Medical Center of Modesto, which has 300 beds, and about 560 doctors with hospital privileges. From the project site to the hospital, Doctors Medical by ambulance is 20-25 minutes and by helicopter 8-10 minutes, while to Memorial Center by ambulance is 25-30 minutes and again 8-10 minutes by helicopter (Larson 2003). Increases in demand for emergency medical services and hospitals would be small due to the short-term nature of construction and the small-expected increase in population during construction and operation.

Water and wastewater discharge is discussed in a separate PSA section entitled **Water Resources**. The WEC project will connect to TID's electrical transmission lines and PG&E will deliver natural gas. Adequate supplies of electricity are available for WEC construction, and gas is available for WEC's operation (TID 2002a) which are discussed in the PSA **Reliability** section. Fire protection is discussed in the PSA section entitled **Worker Safety and Fire Protection**. Solid waste removal is discussed in the PSA section entitled **Waste Management**.

Finally, the WEC project will not directly or indirectly induce substantial population growth. Hence, there are no significant socioeconomic impacts that might trigger adverse physical impacts in the provision of public services

CUMULATIVE IMPACTS

Cumulative impacts might occur when more than one project has an overlapping construction schedule that creates a demand for workers that can not be met by local labor, resulting in an influx of non-local workers and their dependents.

No other projects have been approved or planned in the area in the foreseeable future.

Because the WEC project would not result in any significant adverse socioeconomic impacts to population or housing, or public services, it is unlikely that it would contribute significantly to cumulative socioeconomic impacts. Staff concludes that there are no significant adverse cumulative socioeconomic impacts.

MINORITY AND LOW-INCOME POPULATIONS (ENVIRONMENTAL JUSTICE SCREENING ANALYSIS)

The purpose of the environmental justice (EJ) screening analysis is to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. Staff conducted the screening analysis in accordance with

the “Final Guidance for Incorporating Environmental Justice Concerns in [the Environmental Protection Agencies’] EPA’s [National Environmental Protection Act] NEPA Compliance Analysis,” Guidance Document (EPA 1998). Minority populations, as defined by this Guidance Document, are identified where either:

- the minority population of the affected area is greater than fifty percent of the affected area’s general population; or
- the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

In 1997, the President’s Council on Environmental Quality issued Environmental Justice Guidance that defines minority as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic. Low-income populations are identified with the annual statistical poverty thresholds from the Bureau of the Census’s Current Population Reports, Series P-60 on Income and Poverty (OMB 1978).

Staff has reviewed Census 2000 information that shows minority population by census block is 38.89 percent which is less than staff’s threshold of fifty percent within a six-mile radius of the proposed WEC power plant (See **Socioeconomics Figure 1**). But, there are pockets (census blocks) with greater than 50 percent minority population. Census 2000 by Census Block Group information shows that the low-income population is 16.65 percent within the same radius. Poverty status excludes institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old.

Based on this socioeconomic analysis, staff has not identified significant direct or cumulative, adverse socioeconomic impacts resulting from the construction or operation of the project. The WEC is proposed to be built in an urban area, will not physically alter the community, and will largely utilize a local labor force that will not create any new significant demands on community infrastructure and services. Therefore, there are no socioeconomic EJ issues related to this project.

For a listing of other technical sections that include an EJ analysis, please refer to the **Introduction** section of this **Preliminary Staff Assessment**. For a summary of Environmental Justice impacts regarding these other sections, please see the **Executive Summary**.

Socioeconomics Figure 1

FACILITY CLOSURE

The WEC AFC did not provide for the inclusion of socioeconomic LORS that will be incorporated into the facility closure plan when it becomes necessary at the end of the project's economic life. The socioeconomic impacts of facility closure will be evaluated at that time. The planned lifetime of the proposed power plant is 30 years.

Any unexpected, temporary closure would not likely cause any significant environmental impacts on the affected area, because the likely result of a temporary closure would be reactivation of the power plant by the same or a new owner within a relative short period of time. Personnel changes may occur if there is an ownership change, but socioeconomic impacts would not change significantly because the number of operation personnel would remain relatively the same.

Any unexpected, permanent closure of the WEC would not likely cause any significant adverse socioeconomic impacts on the affected area, because facility closure impacts (i.e., dismantling) would be similar to construction impacts, and staff has found no significant adverse socioeconomic impacts due to the construction of the project. However, a facility closure plan would be analyzed to determine if there would be any socioeconomic impacts.

MITIGATION

Since staff has not identified any significant adverse socioeconomic impacts, no mitigation measures are proposed.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

There are estimated gross benefits from the WEC project, which include increases in sales taxes, employment, and income for Stanislaus County. For example, during construction, there are estimated to be 124 direct project-related construction jobs for 24 months of construction, resulting in 212 total jobs that will be created, of which 88 are secondary (indirect and induced) jobs. Secondary construction income impacts are estimated at $2,071,184 with the total $11,808,784. For operations, 21 direct jobs will be created with 44 secondary (indirect and induced) jobs for a total of 65 jobs. Secondary operation income impacts are estimated at $1,366,960 with a total of $8,468,960. The local sales tax on materials (purchase of equipment) during construction is estimated to be $147,500 to $295,000 some of which would be returned to Stanislaus County and the study area communities.

Staff finds that the WEC project will not cause a significant adverse socioeconomic impact on the affected area's (i.e., the labor supply area) housing, schools, police, emergency services, hospitals, and utilities. Based on staff's demographic screening

analysis, the minority population and low-income population within six miles of the proposed power plant site met the threshold of less than 50 percent, and this was true for low-income people as well. There were no significant adverse socioeconomic impacts since most of the construction and operation workforce is within the regional or local labor market area and construction activities are short-term. Staff has determined that there would be no significant adverse direct or cumulative socioeconomic impacts and, therefore, there are no socioeconomic environmental justice issues.

The WEC project, as proposed, is consistent with the applicable socioeconomic LORS.

The following **Socioeconomics Table 2** provides a summary of socioeconomic data and information from this analysis, with emphasis on economic benefits of the WEC project.

SOCIOECONOMIC DATA AND INFORMATION - TABLE 2[5]	
Project Capital Costs	$160-$220 million
Estimate of Locally Purchased Materials	
Construction	$2-$4 million
Operation	$2 million
Estimated Annual Property Taxes	Not applicable. TID is a public agency.
Estimated School Impact Fees	TID is exempt.
Direct Employment	
Construction	124 jobs
Operation	21 jobs
Secondary Employment	
Construction	88 jobs
Operation	44 jobs
Direct Income	
Construction	$9,737,600
Operation	$7,101,995
Secondary Income	
Construction	$2,071,184
Operation	$1,366,965
Payroll	
Construction	Total-$26 million, $15 million in Stanislaus County.
Operation	$1.3 million to the region.
Estimated Sales Taxes	
Construction	$147,500 to $295,000
Operation	$147,500 with $20,000 to places of sale.
Existing /Projected Unemployment Rates	Existing - 11.5 percent in December 2002, not seasonally adjusted. Projected - Not available.
Percent Minority Population (6 mile radius)	38.89%
Percent Poverty Population (6 mile radius)	16.65%

RECOMMENDATIONS

Staff does not propose any socioeconomic conditions of certification be adopted.

[5] Table 2 uses 2002 dollars, construction is for two years, and project life planned for 30 years. Economic (non-fiscal and fiscal) impacts, unemployment, and population information are generally for Stanislaus County.

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SOILS AND WATER RESOURCES

Lorraine White

INTRODUCTION

This section analyzes potential effects on soil and water resources that would be caused by the Walnut Energy Center (WEC), as proposed by the Turlock Irrigation District (TID or applicant). The analysis specifically focuses on the potential for the project to:

- accelerate wind or water erosion and sedimentation;
- exacerbate flood conditions in the vicinity of the project;
- adversely affect surface or groundwater supplies;
- degrade of surface or groundwater quality; and
- comply with all applicable laws, ordinances, regulations and standards (LORS).

Where the potential for impacts is identified, staff has proposed mitigation measures to reduce the significance of the impact and, as appropriate, has recommended conditions of certification.

Solid waste disposal is also discussed in the **Waste Management** section, as are land use effects in the **Land Use** section of this staff assessment.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Clean Water Act (CWA)

The Clean Water Act (33 U.S.C. Section 1251 et seq.) was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES). In California, NPDES permitting authority is delegated to, and administered by the nine Regional Water Quality Control Boards (RWQCB).

Section 401 of the Clean Water Act requires that any activity that may result in a discharge into a water body must be certified by the RWQCB. This would apply to stream crossings during pipeline construction. This certification ensures that the proposed activity will not violate state and federal water quality standards.

Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers (ACOE) to regulate the discharge of dredged or fill material within the waters of the U.S.

and adjacent wetlands. The ACOE issues individual site-specific or general (nationwide) permits for such discharges.

Resource Conservation and Recovery Act

The Resource Conservation Recovery Act (RCRA) of 1976 (40 CFR Part 260 et seq.) seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.

STATE

California Constitution, Article X, Section 2

This section requires that the water resources of California be put to beneficial use to the fullest extent possible. The waste, unreasonable use, or unreasonable method of use of water is prohibited. The conservation of such waters is to be exercised with a view to the reasonable and beneficial use in the interest of the people and for the public welfare. The right to water or to the use or flow of water in or from any natural stream or water course in the state is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use, or unreasonable method of use, or unreasonable method of diversion of water. This section is self-executing, and the legislature may also enact laws in the furtherance of the policy contained in this section.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. Those criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. Water quality criteria for the project area are contained in the Water Quality Control Plan for the Central Valley Region. This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes to the state's waters and land. Those standards are applied to the proposed project through the Waste Discharge Requirements (WDRs) permit issued by the RWQCB. In the case of WEC, water quality criteria and standards are administered by the Central Valley Regional Water Quality Control Board.

California Water Code

Section 13551 of the Water Code prohibits the use of "…water from any source of quality suitable for potable domestic use for non-potable uses, including …industrial… uses, if suitable recycled water is available…" given conditions set forth in Section 13550. These conditions take into account the quality and cost of the water, the potential for public health impacts and the effects on downstream water rights, beneficial uses and biological resources.

Section 13552.6 of the Water Code specifically identifies that the use of potable domestic water for cooling towers, if suitable recycled water is available, is an unreasonable use of water. The availability of recycled water is based upon a number of criteria that must be taken into account by the SWRCB. These criteria are that the quality and quantity of the reclaimed water are suitable for the use, the cost is

reasonable, and the use is not detrimental to public health, will not impact downstream users or biological resources, and will not degrade water quality.

Section 13552.8 of the Water Code states that any public agency may require the use of recycled water in cooling towers if certain criteria are met. These criteria include that recycled water is available and meets the requirements set forth in section 13550; the use does not adversely affect any existing water right; and if there is public exposure to cooling tower mist using recycled water, appropriate mitigation or control is necessary.

Recycling Act of 1991

The California Legislature's Water Recycling Act of 1991 (Water Code § 13575 et seq.) makes the following findings and declarations:

- the state is subject to periodic drought conditions;
- the development of traditional water resources in California has not kept pace with the state's population, which is growing at the rate of over 700,000 per year and is anticipated to reach 36 million by the year 2010;
- there is a need for a reliable source of water for uses not related to the supply of potable water to protect investments in agriculture, green belts, recreation, to replenish groundwater basins, and to protect and enhance fisheries, wildlife habitat, and riparian areas;
- the environmental benefits of reclaimed water include a reduced demand for water in the Sacramento-San Joaquin Delta, reduced discharge of waste into the ocean, and the enhancement of groundwater basins, recreation, fisheries, and wetlands;
- the use of reclaimed water has proven to be safe, and the State Department of Health Services (DHS) is updating regulations for its use;
- the use of reclaimed water is a cost-effective, reliable method of helping to meet California's water supply needs;
- the development of the reclaimed water infrastructure will provide jobs and enhance the economy of the state;
- retail water suppliers and reclaimed water producers and wholesalers should promote the substitution of reclaimed water for potable and imported water in order to maximize the appropriate cost-effective use of reclaimed water in California;
- reclaimed water producers, retail water suppliers, and entities responsible for groundwater replenishment should cooperate in joint technical, economic, and environmental studies, as appropriate, to determine the feasibility of providing reclaimed water service;
- retail water suppliers and reclaimed water producers and wholesalers should be encouraged to enter into contracts to facilitate the service of reclaimed and potable water by the retail water suppliers in their service areas in the most efficient and cost-effective manner; and
- reclaimed water producers, wholesalers and entities responsible for groundwater replenishment should be encouraged to enter into contracts to facilitate the use of

reclaimed water for groundwater replenishment if reclaimed water is available and the authorities having jurisdiction approve its use.

- Wholesale prices set by reclaimed water producers and reclaimed water wholesalers should reflect an equitable sharing of the costs and benefits associated with the development and use of reclaimed water.

Tertiary Wastewater Treatment Permit

Under Title 23 of the California Code of Regulations, the California DHS reviews and approves wastewater treatment systems to meet tertiary treatment standards, allowing recycled use of water for industrial processes such as for steam production and cooling water.

The California Safe Drinking Water and Toxic Enforcement Act

This Act (California Health & Safety Code Section 25249.5et seq.) prohibits actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity. The requirements of the Act are administered by the RWCQB.

POLICIES

State Water Resources Control Board

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principal policy of the SWRCB that addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on June 19, 1976 by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy requires that power plant cooling water should come from, in order of priority: wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland wastewaters of low total dissolved solids, and other inland waters. This policy also addresses cooling water discharge prohibitions.

State Water Resources Control Board Resolution No. 68-16 (the “Anti-Degradation Policy”) declares the state’s policy that, among other things, the discharging of wastes will not pollute or result in a nuisance.

State Water Resources Control Board Resolution 77-1 encourages and promotes reclaimed water use for non-potable purposes.

LOCAL

County of Stanislaus

The County of Stanislaus requires new projects to comply with grading and drainage requirements. The County’s Measure X also requires an on-site treatment system for industrial projects’ sanitary sewer discharge.

City of Turlock

The City of Turlock requires an Encroachment and Grading permit (City Ordinance No. 981-CS) for new projects specifying that these projects not cause erosion or flooding of any natural drainage. In addition, water service and sewer discharge will be required to conform to requirements for a Water and Sewer Permit.

ENVIRONMENTAL SETTING

PROJECT DESCRIPTION

TID proposes to build the WEC, a nominal 250 MW combined cycle plant (one steam turbine and two combustion turbine design), in the City of Turlock in Stanislaus County. TID proposes to operate this facility as a baseload unit with an annual availability of 92-98 percent. The applicant proposes to construct WEC on 18 acres of a 69-acre parcel. The remaining 51 acres of the site will be used for a temporary construction and equipment laydown area (TID 2002a). As proposed the site will be elevated approximately two feet to provide a level grade. After construction is completed, the 51-acre laydown area will be returned to agricultural development or other uses as determined by TID. For operation of the WEC several new linear facilities (transmission lines, natural gas pipeline and water supply lines) will be required. Please refer to **Project Description** section of this document for a complete description and diagrams of the proposed project and these ancillary facilities.

During construction the applicant proposes to use water from the existing well at the TID Walnut Substation or, if useable, the well located just north of the plant site on the 69-acre parcel. For construction, the average daily demand is estimated to be 10,000 gal/day and the peak daily demand is estimated to be 100,000 gal/day when filling tanks and pipes for hydrostatic testing. The annual construction water demand is estimated to be 2.6 million gallons.

Once operational, more than 1,800 acre-feet per year (AFY) of water will be required for WEC operation (see **Soils & Water Table 1**). Approximately 97-98 percent of the power plant water demand is for cooling purposes. As proposed, recycled water provided by the City of Turlock Wastewater Treatment Plant will be used for cooling once the facility has completed its tertiary, disinfected treatment improvements (May 2006). If approved, TID expects the project to be completed in the fall of 2005. During the interim period between the expected completion of the power plant and the WWTP improvements, the applicant proposes to use potable water supplied by the City of Turlock until the recycled water is available. During the interim period, the applicant does not expect to use as much fresh water (an annual average of 900 AFY) as compared to recycled water because of the higher quality of potable supplies. After recycled water is delivered to the project, potable water will be used only for drinking, showers, fire service, sanitary and as back-up in the event of an unexpected interruption in recycled water delivery. At this time, the applicant has not determined the amount of back-up supplies that may be needed by WEC. Above ground storage tanks are proposed for both recycled water (500,000 gallons, a four hour supply) and potable water (capacity not known).

Water use for the proposed WEC is divided into four main applications based on the quality required: 1) water for the circulating or cooling water system; 2) service water for the plant, which includes all other miscellaneous uses; 3) demineralized water for makeup to the Heat Recovery Steam Generators (HRSG's) and auxiliary boilers; and 4) potable water for drinking and lavatory use. Service water for the plant, including fire water, will be obtained from the city and stored in a 240,000 gallon above ground tank that can provide approximately two hours of flow at 2,000 gallons per minute (gpm). Demineralized water for makeup to the HRSG's and auxiliary boilers will be obtained from the zero liquid discharge (ZLD) system, passed through a mixed bed ion exchange demineralizer and then stored in an on-site tank (250,000 gallons).

Soils & Water Table 1 briefly summarizes water uses for WEC and wastewater discharge:

Soils & Water Table 1
WEC Water Balance

Use	Average Day (mgd)	Peak Day (mgd)	Max Annual (AFY)
Cooling and Process	1.4	2.0	1,800
Potable	0.002	0.002	3
Total Consumption (Net)	**1.402**	**2.002**	**1,803**
Blowdown HRSG's	Recycled To Cooling Tower	Recycled To Cooling Tower	
Blowdown Cooling Tower	Recycled to Cooling Tower	Recycled to Cooling Tower	
Plant Drainage	Recycled to Cooling Tower	Recycled to Cooling Tower	
Brine Concentrator	Recycled to Cooling Tower & HRSG's	Recycled to Cooling Tower & HRSG's	
Sanitary Wastewater	0.0005	0.0005	To Leach Field
Wastewater Discharged Offsite	**0**	**0**	**0**

Notes:
1. Blowdown from the cooling tower assumes 3.5 cycles of concentration.
2. Average flow rates reflect conditions at ambient 61 degrees and peak is at 97 degrees ambient.

Source: (TID 2003a, CH2Mhill 2003b)

Cooling process

Cooling water is needed to dissipate waste heat from the generating process. The power plant cooling system consists of a deaerating steam surface condenser, cooling tower, and circulating water system (TID 2003a). Evaporative cooling will also be used to cool intake air to the combustion turbine generator (CTG) (CH2Mhill 2003b). The heat rejection system will receive exhaust steam from the low-pressure steam turbine and condense it to water for reuse. The surface condenser will be a shell-and-tube heat exchanger with the steam condensing on the shell side and the cooling water flowing in one or more passes inside the tubes. The condenser will remove between 250 and 670 MMBtu/hr depending on ambient weather conditions and plant load. Approximately 66,000 gpm of circulating water is required to condense the steam at maximum plant load.

The cooling water will circulate through a counter-flow mechanical draft-cooling tower. The water will pass over the condenser by gravity as air is drawn upward by the use of electric-motor-driven fans to move the air in a direction opposite to the flow of the water. The cooling tower is comprised of 19 cells or fan bays. The cooling system must be replenished with “make-up water” to replace water lost to evaporation, drift, and blowdown. The cooling system takes advantage of evaporation to remove heat, but cooling system water is “lost” through the evaporation. As the water flows downward a fine mist of water droplets is entrained in the warm air leaving the tower. This mist is termed “drift” and will be limited to 0.0005 percent of the circulating water flow or 33 gpm at maximum flow by the use of drift eliminators. Evaporative losses cause the concentration of impurities in the recirculating water. Blowdown is the bleeding off of a small percentage of the total flow, so that the new make-up water balances the impurities to stay within system specifications. Blowdown volumes are dependent on the quality of the make-up water and the system specifications regarding the impurities that are in the make-up water. Cooling water supplies will be supplemented with HRSG blowdown and ZLD distillate.

Wastewater

TID proposes to treat all process and blowdown waste streams from WEC with a zero liquid discharge (ZLD) system that uses a brine concentrator, crystallizer and filter or belt press to dewater the salt cake. This system eliminates any liquid waste discharge and allows for the recycling of distillate (evaporated steam) back to the cooling towers or demineralizer system for make-up to the HRSGs. To minimize variations in flow rates to the brine concentrator, cooling tower blow down will be directed to a storage tank. Prior to the brine concentrator, stored blowdown will be filtered to remove suspended solids. The final solid waste or salt cake will be disposed of offsite at a municipal disposal site. Approximately five truckloads per week will be generated as a result of project operation (TID 2002b). For a further discussion of the solid waste disposal issues, please refer to the **Waste Management** and **Traffic and Transportation** sections of this document.

Sanitary wastewater will be discharged into a septic tank and leach field system, which will be established in a raised bed in order to maintain percolation above the shallow groundwater.

SITE AND VICINITY DESCRIPTION

The parcel and much of the rights-of-way being acquired by TID are currently used for agricultural purposes - irrigated crops and dairies primarily. Other portions of the linear routes are along existing road rights-of-way. WEC is to be located southeast of the intersection of West Main Street and South Washington Road (access to the site will be from Washington Rd.). The site is relatively flat and surrounded on all sides by elevated ground.

Land uses in the project vicinity not only include irrigated crops and dairies, but also orchards, processing facilities, roads and residential areas.

SOILS

Most of the land to be used by the applicant is classified as prime farmland, as is most of the surrounding area. Site elevation is approximately 85 feet above mean sea level (msl) and is to be raised about two feet above grade.

Dinuba Sandy Loam is the soil type covering the entire WEC site. Dinuba Sandy Loam is also the soil type encountered most along the linear routes, with minor amounts other soils types (see **Soils & Water Table 2**). Dinuba Sandy Loam is a moderately well-drained soil, but Hilmar loamy sand which is found along the linear routes is somewhat poorly to poorly drained. Given this poorly drained characteristic and the occurrence of shallow groundwater, jurisdictional wetlands may be encountered along the water supply and natural gas pipeline routes.

Soils & Water Table 2
Soil Types Affected & Characteristics

Project Element	Primary Soil Type	Slope Class %	Fertility	Erosion Hazard	Perme-ability	Drainage	Est. Soil Loss, Bare (tons)	Est. Soil Loss, Vegetated (tons)
WEC Plant and access roads	Dinuba Sandy Loam (DrA)	0 – 1%	Moderate	Slight	Moderate	Moderately Well	114.49	0.051
Water Supply Pipelines	DrA	see above					4.081	0.0018
	Hilmar loamy sand (HfA)	0 – 1%	Low	Moderate (wind)	Very Rapid	Somewhat Poorly & Poorly	3.109	0.0012
	Hilmar sand (HmA)	0 – 3%	Low	High (wind)	Very Rapid	Somewhat Poorly & Poorly	0.527	0.0002
Natural Gas Line	DrA	see above					6.227	0.0028
	Dinuba sandy loam – slightly saline-alkali (DwA)	0 – 1%	Low	Slight	Slow	Moderately Well	13.316	0.0059
	HfA	see above					0.144	0.0006
Transmission Line (69 kV)	DrA	see above					2.023	0.0009
	DwA						0.206	0.0001
Transmission Line (115 kV)	DrA	see above					0.743	0.0003
Total Losses							**144.866**	**0.0648**

Source: TID 2003a, Table 8.9-2; USDA 1964.

Water erosion potential is slight for most of the soils likely to be encountered. However, certain soils have moderate to high wind erosion potential (HfA and HmA) that could contribute to loss of soils during grading and excavation activities (TID 2002a).

Phase I and Phase II Environmental Site Assessments were conducted for the WEC site. The results of these assessments indicated that no chemical residues were detected in the soils and the low level metal concentrations were indicative of native soils (TID 2002a, Appendix 8.13B).

GROUNDWATER

The Turlock Groundwater Basin is bounded by the Tuolumne River on the north, Merced River on the south, San Joaquin River on the west and the low-permeability Valley Springs formation rocks in the foothills of the Sierra Nevada to the east. It is overlain by portions of Stanislaus and Merced counties and is divided into three zones. Fresh water is found in two zones: the upper unconfined aquifer and a lower confined aquifer that are is separated from each other by Corcoran clay (occurring 140-200 feet deep). Typically depth to groundwater in the Turlock Basin varies from 15 feet below ground surface (bgs) in the western part to 35 feet bgs in the eastern part, but may be shallower in some areas (TID 2002). In the vicinity of the project depth to groundwater is approximately one to five feet bgs (TID 2002a, CH2Mhill 2003a). A third deeper confined aquifer contains saline brine (TID 1997). Groundwater of variable quality is typical in the area of the proposed project. Locally, shallower wells provide low-quality water to individual domestic users (see **Soils & Water Table 3**). Deeper wells provide water of higher quality.

Groundwater use during the last 100 years has had major impacts on the aquifer system, such as decline in water levels, depletion of aquifer storage, and land subsidence. Groundwater remains the current sole source of domestic water for Turlock and the surrounding communities (Turlock 2002). Although subsidence has resulted due to a lowering of the water table in much of the valley, no recorded incidence of subsidence has occurred in the project area. By 2020 depth to groundwater is expected to decline to 90 feet (TID 2002). Nitrate is the most common occurring contaminant in the area, introduced by fertilizers, septic systems and livestock. Other contaminants found in well water samples include organics (tetrachloroethylene (PCE), toluene and chloroform), and naturally occurring radioactivity, chloride, and trace metals. Increasing demands on the groundwater supplies will likely lead to continued deterioration of groundwater quality. Evapotranspiration far exceeds annual precipitation rates requiring supplements to groundwater resources to be imported, mostly from Don Pedro Reservoir (TID 2002).

Soils & Water Table 3
Shallow Ground Water Quality

Constituent	Units	MCL/Action Level [a]	Range
Sodium	Mg/l	None	1.17 - 6.31
Calcium	Mg/l	None	1.85 – 7.14
Magnesium	Mg/l	None	1.15 – 4.19
Bicarbonate	Mg/l	None	2.10 – 9.25
Chloride	Mg/l	250 [c]	0.76 - 6.71
Phosphorus	Mg/l	None	<0.01 – 0.81
Potassium	Mg/l	None	0.60 – 4.50
Nitrate	Mg/l	45 [b] / 1 [c]	16 – 148
Sulfate	Mg/l	250 [c]	14 - 76
Boron	Mg/l	None / 1 [a]	0.04 – 0.18
TDS	Mg/l	1,000 [b] / 500 [c]	497 - 1167
pH		6.0 – 9.0	7.1 – 8.2

Source: TID 2002b, Table 8.14-10.

[a] Action levels are health based advisory levels and not enforceable standards.

[b] Maximum contaminant level as specified in Table 64431-A of Section 64431, Title 22, of the California Code of Regulations

[c] Secondary maximum contaminant level as specified in Table 64449-B of Section 64449, Title 22, of the California Code of Regulations

mg/L = milligrams per liter

SURFACE WATER HYDROLOGY

The climate in the project area is typical of the San Joaquin Valley with hot, dry summers and mild winters. The rainy season generally extends from November through April. Average annual precipitation is about 12 inches. Average monthly precipitation is as shown in **Soils & Water Table 4**. Elevated ground surrounding the site prevents offsite discharge of storm water to adjacent properties. The site is located outside of the 100-year flood plain.

Soils & Water Table 4
Average Monthly Precipitation near the WEC Site

Precip.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(inches)	2.36	2.03	2.01	1.02	0.43	0.06	0.02	0.02	0.20	0.56	1.27	1.96

Source: AFC Table 8.14-5, DWR #B00 9073 003257 00.

Within approximately 10 miles of the project, several natural and man-made surface water features exist. These include the Tuolumne, Merced and San Joaquin Rivers. Water from these rivers is then pumped into canals and drains for irrigation purposes. Near the project is the Turlock Main Canal that transports water from the Turlock reservoir feed by the Tuolumne River. The Harding Drain is a man-made facility designed and maintained by TID that carries the WWTP's treated effluent, TID's operational spill water, tailwater from agricultural practices, stormwater runoff, groundwater dewatering and subsurface drain flows and historically, illegal runoff from dairies (Order No. 5-01-122). Lateral No. 5 is a concrete lined irrigation canal, tributary to the San Joaquin River that would be crossed by the proposed WEC gas pipeline.

Don Pedro Lake, located east of Modesto in the Sierra-Nevada foothills, is the sixth-largest body of water in California. When full, the reservoir is 26-miles-long, has a capacity of more than two million acre-feet. Dedicated in 1971, the reservoir and dam provides water and hydro-power for TID and Modesto Irrigation District, municipal water supplies for the City and County of San Francisco, flood control for the U.S. Army Corps of Engineers (http://www.tid.org), and recreational opportunities.

Turlock Irrigation District

TID's service area covers 425-square-miles in Stanislaus and Merced counties providing electricity to Ceres, Turlock, Keyes, Denair, Hughson, Hickman, La Grange, South Modesto, Ballico, Delhi, and Hilmar. The District provides both water and electricity services.

TID serves over 5,800 irrigation customers covering approximately 150,000 acres of farmland over a season that traditionally runs from March 15 to Oct. 15. Water allotments for growers are based on anticipated runoff in the Tuolumne River watershed. TID diverts most of its water from the Tuolumne River. The Don Pedro Dam and associated power house are both located on the river. During dry years, the district

pumps groundwater (conjunctive use) into its canal system. The district owns and operates more than 250 miles of canals (primarily gravity fed) stretching from La Grange Dam on the Tuolumne River to the San Joaquin River. More than 90 percent of the canals are concrete lined. Most of the land within TID is flood irrigated. TID's average dry year delivers are approximately 400,000 AFY and their average wet year deliveries are approximately 427,000 AFY (Kavarian 2003).

TID serves electricity to more than 73,000 customers (residential, agricultural commercial, industrial, and municipal). TID generation resources (Don Pedro Powerhouse two natural gas-fired power plants and other district facilities) supply 35-40 percent of its customer's demands. The rest of the energy is purchased under long- and short- term contracts from other suppliers. (http://www.tid.org)

WEC Water Supply

To meet the water requirements of the WEC, TID proposes to use recycled water for the cooling system and process water. Potable water will be used only for drinking, showers, fire service, sanitary and as back-up in the event of an unexpected interruption in recycled water delivery. Groundwater from a nearby well will provide construction water.

Soils & Water Table 5
Estimated and Average Water Quality
(mg/l unless otherwise specified)

Constituents	Recycled Water	Potable Water	Well #313
Alkalinity (total)	206	85	
Aluminum	0.100		
Ammonia	<57		
Arsenic	0.010	ND	
Barium	0.080	0.036	
BOD	<10		
Boron	0.200		
Cadmium	0.002		
COD	<30		
Chloride	104	14	36
Chromium	0.004		
Copper	0.020	0.005	<0.1
Fluoride	0.380	0	
Hardness-Calcium	82	24	55.3
Hardness - Magnesium	9.9	6	
Total Hardness	143	85	237
Iron	0.440	ND	<0.1
Lead	0.012	ND	
Manganese	0.047	ND	<0.1
Molybdenum	0.010		
Nickel	0.010		
Nitrate	<20 (N)	15 (NO3)	
pH (pH units)	6.5-7.5	7.61	7.47
Potassium	20	3	
Selenium	0.010		
Silica	57		59
Silver	0.003		
Sodium	145	24	74
Specific Conductance (micromhos/cm)	101.1	258	729.3
Sulfate	45	9	36.5
TDS	537	214	496
TSS	<1		
Turbidity (NTUs)	2 or less		0.30
Zinc	0.080	ND	<0.1

Source: TID 2002a, Table 8.14-4, TID 2002b 8.14-9 and CH2Mhill 2003b, Well Data, 1984.

City of Turlock

Turlock is home to more than 59,000 people (http://www.ci.turlock.ca.us). Water, storm and wastewater services, as well as other services are provided by Municipal Services.

All of Turlock's water comes from deep wells ranging in depth from approximately 150 to 500 feet below ground surface. As mentioned above, groundwater resources on which the city depends are known to be overdrafted. Over the years per capita use has dropped from about 400 gallons a day as of 1981 to 277 gallons per day in 1991. This use is not quite twice the national average (Turlock 1993). In 2002, Municipal Services managed 15,320 connections and provided 8 billion gallons (24,547.4 AFY) (Madden 2003a). Peak daily water deliveries of water to the city's customers are approximately 36 million gallons (July 10, 2002) and peak monthly deliveries of 1,000.5 billion gallons (June 2002). The city has a peak daily production capacity of 45.1 million gallons (assuming all pumps are operating). Over the next twenty years, the city expects demands on water resources to increase (see **Soils & Water Table 6**).

Soils & Water Table 6
Projected Water Use, City of Turlock

Year	Estimated Population	Average Use (gpm)	Maximum Use (gpm)
2010	87,352	17,678	33,588
2020	125,620	19,428	36,913

Source: City of Turlock Water System Master Plan, 1993
Projections based on land use and corresponding demand coefficients.

The City of Turlock is currently designing modifications to its existing wastewater treatment plant (WWTP) to achieve new NPDES requirements being imposed by the Central Valley Regional Board. Provisions of the permit allow five years for the city to meet effluent limits regarding BOD, suspended solids, total coliform, turbidity, metals, and bromodichloromethane (CVRWQCB Order No. 5-01-122). The WWTP discharges effluent to the Harding Drain, downstream of the TID Lateral No. 5, tributary to the San Joaquin River. During fiscal year 1999, the City of Turlock's WWTP treated a total of 12,734 acre-feet of wastewater. To meet these requirements the city is building a Title 22, disinfected, tertiary water treatment facility with an expected capacity of 20 mgd. This facility will incorporate various redundant systems to minimize disruptions in the treatment process and ensure compliance with the Board's requirements. None-the-less, the city has developed contingencies to address a worse case scenario for a three-day disruption in the treatment system and recycled water production. According to Dan Madden, City of Turlock, such a scenario is expected to be very rare (Madden 2003b).

Based on the current schedule construction on this facility could begin as early as May 2003 and is expected to be completed by May 2006. Financing for the project has already been approved. To date, staff is unaware of any other industrial customers that may be interested in this resource. Based on available information, the City will have adequate recycled water to serve the project once the Title 22 facility is complete. Other local municipalities in the vicinity of the project already supply approximately 13,000 AFY of treated wastewater to irrigators to reduce demands on surface and

groundwater supplies. TID's Almond Power Plant uses approximately 92 AFY of treated effluent from the City of Ceres.

The City also implements an Industrial Pretreatment program that monitors, permits, and enforces regulations related to discharges into the sanitary sewer system to protect their treatment facility and ensure they comply with their own NPDES permit restrictions. In addition, the City of Turlock has developed a year round water conservation program aimed at encouraging citizens to conserve water whenever possible. Most homes are not metered and customers still pay a flat rate for water consumed.

ANALYSIS OF PROJECT RELATED IMPACTS

DIRECT AND INDIRECT IMPACTS

Soils

The proposed project will result in both temporary and permanent land disturbance (grading, excavation, trenching, paving, etc). Construction of the proposed power plant, laydown area and associated facilities will disturb more than 110 acres of agricultural lands, mostly prime aglands and permanently remove from production approximately 20 acres (see **Soils & Water Table 7**). Portions of the linear facilities are proposed to run along existing roads or in previously developed utility right-of-ways in order to minimize new disturbance to prime farmlands. The new transmission lines will require the placement of transmission line structures on prime agricultural land, but will not prevent current uses.

Soils & Water Table 7
Land Disturbance

Project Element	Size/Length	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Power plant	18 acres	18	18
Access roads (main and emergency)	2 acres	2	2
Laydown and Parking	51 acres	49	0
T-line (combined) double circuit, single pole	2,600 feet	3.6	0.1
Gas Line - 8 inches diam.	3.6 miles	26.2	0
Water Supply Lines	1.6 miles	11.8	0
Total		**110.6**	**20.1**

Source: TID 2003a, Table 8.9-3
Note: The potable water supply line runs along a portion of the recycled water line.

Construction "best management practices" (BMPs) will be required to control wind and water erosion and storm water drainage. Although water erosion potential varies in the project area, grading and other land disturbance can increase this potential. Certain soils likely to be encountered during construction also have high wind erosion potential that can be eroded during grading and excavation construction activities. Various BMPs that can be employed during construction include the use of temporary drains and swales, silt fencing, hay bale barriers, watering loose soil and sand bag barriers as appropriate to prevent soil loss.

Topsoil will be removed from the site and stockpiled prior to placing fill and grading. The site will be built up approximately 18 inches and the topsoil will be replaced to provide a level grade about two feet above current elevation. As much as 50,000 cubic yards of fill may be required for elevating the site and this material will likely be obtained from the unused portion of the 69 acre parcel or imported from local commercial suppliers. Base material will be imported for areas covered in gravel or asphalt. Where unsuitable materials are encountered, materials may be imported for foundations and pipe bedding. Local requirements specify appropriate backfill material within the road right-of-ways, and that no net changes to the existing grading/drainage patterns can occur after trenching.

Prior to the placement of gravel for traffic and dust suppression at the laydown area, a geotextile fabric will be laid underneath to provide extra support and ease in gravel removal. Additional protective material may be required to ensure no contamination of soils as a result of equipment laydown and parking. The applicant provided a very general Administrative Draft Construction SWPPP that included a brief discussion of erosion control measures (CH2MHill 2003e, SW 85a-1). The applicant has stated that they will submit more specific BMPs as part of the final Storm Water Pollution Prevention Plan (SWPPP) and Erosion Control Plan (ECP) prior to the start of construction.

If appropriate BMPs are required and implemented, no significant adverse impacts to soils are expected as a result of construction and operation of the WEC. Staff is

recommending **Conditions of Certification SOILS & WATER 1 and 2** to ensure no adverse impacts occur due to erosion or offsite sedimentation during construction.

Groundwater

Construction of WEC is expected to take approximately 24 months. TID proposes to use groundwater as the source of construction water supply from TID's existing well at the Walnut Substation or the well located north of the plant site. The water will be used to fill an elevated gravity water tank and hydro-pneumatic tank. Installation of the temporary two to three inch pipeline will require trenchless piping across the road and railroad. Construction related water use will be less than water use currently at the site (assuming a maximum of three to four AFY per acre for the 69 acre parcel). Staff, therefore, concludes that impacts related to construction water use will be insignificant.

Potable water provided by the City of Turlock will be used for domestic supplies, as an interim supply until such time as recycled water is available and as a back-up supply to recycled water. The city's water supply comes entirely from groundwater. Groundwater resources in the vicinity of the project are overdrafted and the shallow aquifer is of poor quality. Use of potable supplies to meet interim and back-up demands of WEC may deplete groundwater supplies further. Staff recognizes that impacts associated with the interim supply are expected to be temporary and offset with the use of recycled water once it becomes available. Since the anticipated amount of back-up supplies needed has not been determine at this time, staff evaluated the potential for disruption to the recycle product and current use of water for irrigation at the site.

Currently, a maximum of 4 AFY per acre is allocated to irrigate the parcel being acquired by the applicant, but actual use may be less for average years. Assuming that average year use is 3 AFY per acre and peak is 4 AFY per acre, water use presently at the 18-site to be occupied by the plant is between 54 and 72 AFY. The recycled water supply under worse case conditions would be interrupted not more than three days at a time. If potable water that is derived from groundwater resources is limited to no more than current average water use, but surely no more than 72 AFY, the plant could operate with approximately four, three-day disruptions a year (assuming peak demand). In addition, staff recommends that the applicant increase the on-site storage capacity of recycled water to twice or three times that proposed to mitigate any short-term (up to one day) disruption of recycled water supply. It may be possible for the applicant to offset completely the use of groundwater resources by implementing conservation programs or improving the efficiency of water use. For discussion purposes, staff is recommending **Condition of Certification SOILS & WATER 5** to ensure the use of recycled water and limit the use of potable water for cooling purposes to avoid impacts to local groundwater supplies.

Due to the occurrence of shallow groundwater, the applicant proposes a mounded septic system to be constructed and operated to County requirements. Staff is recommending **Condition of Certification SOILS & WATER 4** to ensure compliance with applicable requirements and protection of groundwater. In addition, dewatering may be required to construct certain underground features. Dewatering may include shallow wells or excavated areas equipped with small submersible pumps used to lower the localized water table for construction. This will allow for locally lowering the water table. Discharge will be piped to the on-site storm water pond that will be used as the

percolation pond for dewatering activities unless the hydraulic gradient between the water levels does not allow for proper dewatering. If this occurs, then a temporary percolation pond will be constructed within the temporary construction area.

The use of recycled water from the City's WWTP will have no adverse effect on groundwater supply and will reduce effluent discharges by the WWTP.

Surface Water Hydrology

No natural streams or rivers will be altered as a result of the WEC development. However, construction of the linear facilities may encounter jurisdictional wetlands due to local soil conditions that allow for pooling of water. In addition, the preferred gas pipeline route requires crossing of Lateral No. 5 at Commons Road. It is possible that this crossing may require a Nationwide Permit 33 (Temporary Construction, Access and Dewatering). The need for a Nationwide Permit will have to be determined by the ACOE and any requirements imposed will need to be incorporated in the SWPPP.

The WEC site is not within the 100-year flood plain. All stormwater is to be contained on-site. Although the project is in the inundation zone for a failure of the Don Pedro Dam and could be flooded within a one-hour period if the dam were to fail completely. Such a situation could only occur if the dam was to give way entirely, releasing all of the two million acre-feet of water within one hour. After review of available studies (CH2Mhill 2003c, SW 91A, B and C), staff believes that such a scenario can be considered extremely unique and unlikely.

Stanislaus County's Standards and Specifications, General Provisions provide information on requirements for drainage retention and associated facilities. Presently the applicant's proposed drainage and stormwater facilities, sized for a 25-year, 24-hour storm, do not comply with the requirements for facilities to be sized for the 50-year, 24-hour storm. At this time, staff has inadequate information to determine compliance with these requirements, specifically the 10-year, 48-hour emptying requirements. Revisions to the applicant's draft SWPPP and Drainage, Erosion and Sediment Control Plan will be required. Staff recommends **Conditions of Certification SOILS & WATER 1 and 2** to ensure compliance with local requirements.

Storm water

Storm water will be managed in accordance with the Storm Water Pollution Prevention Plans (SWPPP's) prepared for construction and industrial activities, under the General NPDES Permit for Discharges of Storm Water Associated with Construction and Industrial Activity respectively. Drainage at the WEC site will be designed to prevent flooding of permanent facilities and roads, both on-site and offsite, and to maintain storm water flows at or below pre-project flows. A berm, located around the entire site, will eliminate offsite drainage.

As proposed, the site will be graded to route surface water around and away from all equipment and buildings. Generally, the site will be sloped from the northeast to the southwest toward the detention pond. Storm water runoff will be detained in the pond (sediment basin) and allowed to percolate into the ground. The pond will have a two acre-foot capacity, will be triangular shaped, and cover approximately 0.75 acres.

Fencing will be placed on two sides with a road and the cooling towers on the hypotenuse side. TID proposes to regularly maintain the pond and periodically clear it of vegetation (TID 2002b).

Storm water developed over the project site will be managed separately between areas containing chemicals or oil-filled equipment (process areas) from areas not posing a potential for hazardous material spill (non-process areas). Open process areas will be curbed to contain the maximum 25-year, 24-hour design storm runoff in addition to the volume of the largest storage container. Storm water drainage will be conveyed to an oil/water separator, and then into the cooling tower basin. The system of individual containments and the routing of process area storm water to the cooling tower basin, will serve to maintain storm water flows incrementally below pre-project levels. Storm water from non-process areas will be conveyed through an oil/water separator into the pond. Modification to the proposed sizes and capacities of these facilities will need to meet the county requirements for 50- year, 24-hour storm water retention and facilities.

With construction and maintenance of the berm and pond, stormwater and sediment can be managed on-site. Staff is recommending **Conditions of Certification SOILS & WATER 1 and 3** to ensure compliance with the requirements of the NPDES program, proper implementation of SWPPP's for both construction and operation of the project and to meet local requirements.

Recycled Water Use

The project's maximum use of recycled water will not adversely impact surface water supplies, but may result in benefits to these resources. WEC's recycled water use will be relatively consistent on a month-to-month basis, not seasonal like agriculture or landscape/golf course irrigation. It will minimize demands on fresh water supplies by WEC and will also avoid discharge by the WWTP of a portion of its effluent to the Harding Drain and ultimately to the San Joaquin River.

TID's proposed use of recycled water is consistent with the state's statutory requirements and policies for the protection of water quality, conservation of fresh inland water and the use of recycled water.

In the Stanislaus County General Plan, Conservation and Open Space Element (Chapter 3), the county has specified implementation measures to ensure the goal of conserving water resources and protecting water quality is achieved (Goal Two). These measures include the incorporation of conservation measures in new development and require controls for point source pollutants. Developers are responsible for showing that their development will not adversely impact water resources. Staff finds that TID's proposed use of recycled water and incorporation of a ZLD system will minimize demands on fresh water supplies, increase efficiency of water use and eliminate wastewater that could degrade surface water supplies.

Impacts to Local Water Supplies

Water Code Section 13550 et al, specifically, Section 13552.6 identifies that the use of potable domestic water for cooling towers is a waste or unreasonable use of water if suitable reclaimed water is available and the water meets the requirements set forth in

Section 13550. Those criteria include provisions that the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and will not impact downstream users or biological resources. By May 2006, The City of Turlock expects to produce 20 mgd of Title 22, disinfected tertiary treated recycled water. The city has provided a will serve letter to TID stating its willingness to serve WEC with recycled water. At this time, staff is unaware of any other customer for this water supply. WEC's peak daily demand (1.4 mgd) will consume seven percent of the expected recycled supply and its use is encouraged by staff because it will reduce demands on higher quality fresh water supplies.

TID proposes to use potable water for an interim water supply and as back-up supplies to recycled water. Title 20, Chapter 5, Appendix B, subsection (g)(14)(C)(i) of the California Code of Regulations places the burden on the applicant to discuss all other potential sources of water, if freshwater is proposed for cooling purposes, and to explain why these other sources are not feasible. The applicant has provided an assessment of other alternatives to the use of potable water for the interim supply and as back-up in the event of a failure of the recycled water system. Staff is concerned about the use of potable water derived from an overdraft basin for cooling and back up supplies for WEC.

For discussion purposes, staff recommends **Conditions of Certification SOILS & WATER 5 and 6**. Staff believes that groundwater use can be limited or offset by conservation efforts that would result in no net increase in groundwater pumping to serve WEC. According to Mr. Madden with the City of Turlock, redundant systems are incorporated in the design of the city's tertiary treatment system and only under the worse conditions are recycled water services to be disrupted (3 days maximum at any one time). As discussed above, staff is recommending that water use by WEC result in no net increase in groundwater extraction. For discussion purposes, staff recommends that total annual potable water or groundwater use not increase above that which is currently used to irrigate the 18 acre parcel. Staff would like to explore additional conservation efforts with the applicant that could reduce groundwater demand further. Staff will work with the applicant to address these concerns and identify possible conservation or mitigation to address any possible impacts associated with this water use. These measures will be discussed further in the Final Staff Assessment (FSA).

Possible Alternatives to the Proposed Water Supply

Staff did not evaluate alternatives to TID's proposed use recycled water as its primary water supply because this use is consistent with staff efforts to conserve fresh water resources and WRC 13550. Recycled water use may also provide environmental benefits to the San Joaquin River by reducing effluent flows by the WWTP. However, the applicant has proposed to use potable water derived from groundwater resources for the interim and back up supplies to WEC. Due to the overdraft conditions and deteriorating quality of the local groundwater supplies, TID was asked to explore alternatives to this potable water use and determined that no alternative was feasible (CH2Mhill 2003c). As stated above, staff believes that possible conservation efforts could offset potable water use or that alternative measures may lessen impacts to groundwater resources of potable water use by WEC. Staff believes further discussions

with the applicant are needed to address these concerns and recommends **Condition of Certification SOILS & WATER 5** to assist in these discussions.

Wastewater

As proposed, the WEC will use a ZLD system, which effectively treats and recycles all process wastewater streams for reuse within the plant. In doing so, the overall efficiency of water use is increased and demand on water supplies reduced by as much as 20 percent. The primary waste product of the ZLD system is a sludge or salt cake, considered a solid and not a liquid waste, which will be hauled by truck for disposal in a municipal landfill. The Applicant has estimated that generation of salt cake will average approximately 13.45 lbs/min under peak conditions using recycled water. This system will avoid liquid waste discharge and associated water degradation. Staff finds that the use of the ZLD system will avoid potential adverse impacts to water and soil resources.

Sanitary wastewater will be processed using a septic tank and leach field. Because of shallow groundwater in the project vicinity, the system will be constructed according to a mound-type design. The mound system will be designed to comply with the Stanislaus County standard for primary and secondary treatment of commercial and industrial wastewater under Measure X. Staff is recommending **Condition of Certification SOILS & WATER 4** to ensure compliance with these requirements and protection of soil and water resources.

As proposed, wastewater resulting from hydrostatic testing or flushing will be captured on-site and, if of chemical quality similar to the source water, allowed to percolate into the groundwater. Dirt and debris will be captured in the storm water pond. Because this water may contain contaminants, staff recommends that hydrostatic testing water be tested prior to discharge to any pond or containment facility. Protocols for this testing and monitoring shall be contained in the SWPPP to be submitted under staff's recommended **Condition of Certification SOILS & WATER 1**.

Wash and chemical cleaning water may contain high levels of metals and contaminants. Staff is recommending **Condition of Certification SOILS & WATER 7** to ensure proper disposal of these wastewater streams and avoid any adverse impacts to water and soil resources.

CUMULATIVE IMPACTS

WEC will use recycled water to meet its cooling water demands, employ a ZLD system that will eliminate the discharge of wastewater to land, surface water or groundwater and will capture treated and distilled wastewater streams to minimize demands on potable water supplies. The City of Turlock will have ample supplies of recycled water to serve WEC and is looking for other potential users of its future recycled water product in addition to the proposed power plant. The use of recycled water is encouraged and will likely result in benefits to water supplies in the area. Staff is recommending that potable water use by WEC be limited to avoid increases in groundwater pumping and further overdraft of the basin. TID may also implement additional conservation methods to reduce overall groundwater or potable demands. Staff's preliminary assessment concludes that if the recommended conditions of certification are adopted, the project will not result in any significant adverse cumulative impacts.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed WEC power plant (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff considers these to be pockets or clusters. Staff also reviewed Census 2000 information that shows the low-income population is less than fifty percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for soil and water resources. Based on the assessment discussed above, staff has not identified any unmitigated significant direct impacts resulting from the construction or operation of the project, and therefore there are no soil or water related environmental justice issues related to this project. Therefore, there is no potential disparate impact on the minority population, and there are no soil and water environmental justice issues related to this project.

FACILITY CLOSURE

The WEC is expected to operate for a minimum of 30 years. Closure options range from “mothballing,” with the intent of a restart at some time, to the removal of all equipment and facilities.

The decommissioning plan will be submitted to the Energy Commission for approval prior to decommissioning. Compliance with all applicable LORS, and any local and/or regional plans will be required. The plan will address all concerns in regard to potential erosion and impacts on water quality.

MITIGATION

APPLICANT PROPOSED MITIGATION

Soils

The applicant proposes to incorporate standard BMPs into the project design for construction and operation to mitigate erosion and sedimentation impacts. TID has indicated that their Erosion and Sediment Control Plan (Draft E&SCP) will conform to the City of Turlock Municipal code as amended. The Code requires implementation of an interim and final sediment and erosion control plan to ensure no erosion or flooding of any natural drainage.

Groundwater

The applicant has generally described the proposed BMPs for spill prevention and control within the Administrative Draft Storm Water Pollution Prevention Plan (SWPPP) to minimize the potential for groundwater contamination. Recycled water is proposed to be used for cooling and process requirements by May 2006 to offset impacts to local groundwater and potable supplies.

Surface Hydrology

As proposed, all storm water is to be contained on-site and directed to the detention pond.

Storm Water

The applicant has submitted an Administrative Draft SWPPP that included an Erosion and Sediment Control Plan that generally addresses BMPs (see Figure SW-84a-1). This plan will need to be revised to conform with the specific requirements of the General Permit guidelines for SWPPPs to reduce erosion and sedimentation impacts and their possible impacts to surface water quality. Measures established within the SWPPP regarding spill control would also protect surface water resources. Areas will be curbed or bermed where there is a possibility for runoff to encounter contaminants. The runoff from these portions of the site will be routed through an oil/water separator and then to the ZLD system, eliminating this potential source of polluted runoff. The applicant will be required to meet general storm water requirements of the NPDES permit.

As stated in the Data Response SW 85 (CH2Mhill 2003e), permanent hazardous material storage areas are to be provided with secondary containment meeting the requirements of Article 80 of the Uniform Fire Code. Chemical cleaning wastes will be contained in temporary tanks provided by the chemical cleaning contractor. These tanks will be located on the paved area adjacent to each HRSG. During chemical cleaning operations, 24-hour supervision will be provided for visual detection of leaks or spills. Supplies of absorbent material will be maintained on-site for spill cleanup. Stormwater that falls in the containment areas will be discharged to the plant process drain system and recycled to the cooling tower basin. Hazardous material areas located outdoors and not protected from rainfall shall be designed to contain the volume of the largest single tank plus the rainfall associated with the 25-year, 24-hour storm (2.41 inches). Staff is concerned that this may be insufficient to protect stormwater or comply with local requirements and suggests that the sizing be increased to provide for 125 percent of the largest volume single tank and the 50-year, 24-hour storm rainfall.

Wastewater Disposal

To reduce water requirements and eliminate wastewater discharges for the project, the applicant has proposed a ZLD system. Sanitary wastewater is to be directed to a mounded septic system and leach field.

STAFF PROPOSED MITIGATION

Soils

Staff recommends that the applicant be required to meet storm water requirements of the general NPDES permit. As required by Central Valley RWQCB Order 99-08-DWQ (Storm water during construction) and Order 5-00-175 (discharge of short duration or low threat), a SWPPP would be implemented to minimize pollutants in stormwater. In addition, the applicant will be required to develop and implement a site specific Drainage, Erosion and Sedimentation Control Plan for the entire project (including ancillary facilities) that address standard erosion runoff and sedimentation impacts for construction, post-construction, and operational phases. This plan will comply with all

applicable local requirements. These requirements are addressed in **Conditions of Certification SOILS & WATER 1** and **SOILS & WATER 2.** The applicant must revise the draft plans to provide the following amendments and additions within the final plans for the entire proposed WEC project:

- The topographic features of the proposed project including areas involving all proposed pipeline construction, laydown (staging) area, transmission upgrades, and stockpile location(s). The mapping scale should be at least 1"= 100' (1"=50' recommended). Sufficient surrounding area including the topography and existing features should also be provided on the drawings.
- A construction schedule that addresses all BMP installation, maintenance and removal sequences of events from initial site mobilization to final stabilization (i.e. vegetation/asphalt) and plant operation.
- Proposed contours should be shown tying in with existing ones. All proposed utilities including storm water facilities should be shown on the plan drawings. All erosion and sedimentation control facilities should be shown on the drawings. The drawings should contain a complete mapping symbols legend that identifies all existing and proposed features including the soil boundary and a limit of construction. The limit of construction boundary should include the project facility, pipeline areas, stockpile areas, laydown areas, and any off-site staging areas. The limit of construction ensures all work is confined to the proposed WEC project in order to protect all surrounding areas not involved in construction or operation of the proposed project.
- Silt fencing and sandbags should be used to trap sediment, and not as runoff conveyance facilities. Earthen berms or channels can be substituted to intercept sediment-laden runoff and direct it into the sediment retention basin/trap. A sediment trap should be used for drainage areas less than five acres and a sediment basin should be used for drainage areas greater than five acres.
- All excavated material should be kept away from active flows. Site specific BMPs shall be included in narrative and drawing portions of the erosion and sediment control plan. The soil should be covered via a liner or anchored mulch. Areas disturbed during construction should be stabilized via permanent vegetation upon completion of the process.
- Specific BMPs to be employed for all project-related construction including, but not limited, to access roads, directional drilling / tunneling, linear facilities, and any off-site staging areas are to be shown on legible drawings of appropriate scale.
- Proposed vegetative areas and a description of revegetation procedures are to appear on the drawings.
- Soil stockpile management BMPs for water and wind erosion.
- Maintenance and monitoring protocol for erosion/storm water control.

Ground Water

Potable water will be used as an interim supply until recycled water is provided to WEC and a back-up supply. The city obtains it water for potable supplies from local groundwater resources. To minimize the potential for long-term adverse impacts to

groundwater resources staff is proposing to limit the use of potable or groundwater supplies by WEC and offset their use through conservation efforts yet to be defined. In addition, staff recommends that the project demonstrate compliance with local requirements for the mounded septic system (see **Condition of Certification SOILS & WATER 4**).

Surface Hydrology

As proposed, WEC is to be operated as a 'zero-liquid discharge' facility thereby eliminating the need to obtain a NPDES permit other than for storm water discharges. WEC will be required to comply with the general NPDES requirements that regulate storm water discharges and implement the SWPPPs. TID will be responsible for all monitoring and reporting guidelines and other provisions included in the general storm water permits. This requirement is contained in **Conditions of Certification SOILS & WATER 1 and SOILS & WATER 3**.

Water Supply

To mitigate any potential adverse impacts to local fresh water supplies or other users of fresh water and address inadequacies of fresh water supplies, staff is recommending that recycled water use by WEC begin no later than May 2006and that use of potable water be limited after May 2006(**Condition of Certification SOILS & WATER 5)**.

Process and Sanitary Wastewater

The project will operate with a zero-liquid-discharge system that will eliminate all process wastewater discharge. Since the applicant has proposed no back-up for the ZLD system, staff recommends monitoring of the ZLD system and on-site storage facilities (**Condition of Certification SOILS & WATER 7 and SOILS & WATER 8**) as well as facility shut-down in the event of a disruption to the operation of the ZLD system. Compliance with this condition should ensure proper handling, storage and disposal of wastewater generated at the WEC.

The on-site septic system and drainfield must be designed according to applicable county laws in order to prevent any significant impacts to water quality. **Condition of Certification SOILS & WATER 4** requires review of the final design plans by the CPM and Stanislaus County for the protection of water quality. The plans must be approved by the Energy Commission CPM before the start of septic system construction activities.

Storm Water

As stated in the **Surface Hydrology** mitigation discussion above, WEC will be required to comply with the NPDES requirements that regulate storm water by establishing effluent limitations and monitoring and reporting requirements for construction activities storm water, low-threat or short duration discharge, and the industrial activities (operational) dictated by the storm water general permit. The draft SWPPP will need to be revised to be site specific and comply with the guidelines provided in Water Quality Order 99-08-DWQ and 97-03-DWQ.

COMPLIANCE WITH LORS

TID's proposed WEC has been considered with regard to applicable laws, ordinances, regulations and standards (LORS). Staff believes that if the proposed conditions of certification are required and implemented, the project will comply with LORS. For this reason, staff recommends that the project not be licensed without the proposed conditions of certification.

CONCLUSIONS

Staff concludes that the use of recycled water for cooling purposes and the ZLD system at WEC is environmentally beneficial and will conserve fresh water supplies. In addition to mitigation proposed by the applicant, staff recommends additional mitigation prevent acceleration of erosion, increases in off-site sedimentation and contamination of soils and water resources, or increases in flood conditions in the vicinity of the project. Staff is concerned that any increase in groundwater use will exacerbate overdraft conditions in the basin and contribute to further groundwater degradation. Conditions of Certification are recommended to assist in discussions with the applicant and others to address staff's concerns regarding groundwater impacts.

PROPOSED CONDITIONS OF CERTIFICATION

The following conditions have been developed for the project:

SOILS&WATER 1: The project owner shall comply with all of the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the construction of the entire project. Prior to beginning any site mobilization associated with any project element, the project owner shall submit to the CPM a copy of the Notice of Intent for Construction accepted by the RWQCB and obtain Energy Commission CPM approval of the construction activity SWPPP for WEC.

Verification: No later than 60 days prior to the start of site mobilization for any project element, the project owner shall submit a copy of the SWPPP required under the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity to the CPM for review and approval. The SWPPP will include copies of the Notice of Intent for Construction accepted by the RWQCB and any permits for WEC that specify requirements for the protection of stormwater or water quality. Approval of the SWPPP by the CPM must be received prior to site mobilization for any project element.

SOILS&WATER 2: Prior to beginning any site mobilization activities for any project element, the project owner shall obtain CPM approval for a site-specific Drainage, Erosion and Sedimentation Control Plan that addresses all project elements. The plan shall address revegetation and be consistent with the grading and drainage plan as required by **Condition of Certification CIVIL-1**.

Verification: No later than 60 days prior to the start of any site mobilization for any project element, the project owner shall submit the Drainage, Erosion and Sedimentation Control Plan to the CPM for review and approval. No later than 60 days prior to start of any site mobilization, the project owner shall submit a copy of the plan to Stanislaus County and the City of Turlock for review and requesting any comments be provided to the CPM within 30 days. The plan must be approved by the CPM prior to start of any site mobilization activities.

SOILS&WATER 3: The project owner shall comply with all of the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the operation of WEC. The project owner shall submit to the CPM a copy of the Notice of Intent for Operation accepted by the RWQCB and obtain approval of the General Industrial Activities SWPPP from the Energy Commission CPM prior to commercial operation of the WEC.

Verification: No later than 60 days prior to the start of commercial operation, the project owner shall submit to the CPM a copy of the SWPPP required under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity to the CPM for review and approval. The operational SWPPP shall include copies of the Notice of Intent for Operation accepted by the RWQCB and any permits for WEC that specify requirements for the protection of stormwater or water quality. Approval of the operational SWPPP by the CPM must be received prior to start of commercial operation. In addition, the project owner shall submit to the CPM copies of the annual monitoring report for storm water as normally submitted to the Central Valley RWQCB under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity.

SOILS&WATER 4: The on-site septic system shall be designed and operated to prevent any adverse impacts to water quality. Prior to construction of the on-site sanitary wastewater treatment facility (septic system), the project owner shall obtain CPM approval for this system. Prior to CPM approval, written confirmation shall be submitted by the project owner from the Stanislaus County that the proposed facility design meets all applicable County requirements.

Verification: No later than 60 days prior to construction of the on-site sanitary wastewater treatment facility for WEC, the project owner shall prepare detailed engineering drawings for this facility and submit these drawings with a detailed description to the CPM and Stanislaus County for review. The detailed description shall include information on infiltration rates, existing groundwater quality and depth to groundwater. Within 30 days of submitting the detailed engineering drawings, the project owner shall provide written confirmation to the CPM from the Stanislaus County that the design meets all applicable County requirements. Prior to constructing the sanitary waste treatment facility, the project owner will obtain CPM approval for the facility design.

SOILS&WATER 5: Total water use by the project owner for the operation of WEC and associated landscape irrigation shall not exceed a peak demand of 1,803 acre-feet per year and a peak daily flow of 2.002 mgd. Groundwater from the Walnut Substation well or the well at the project site shall only be used for construction water supplies. WEC shall use tertiary treated, recycled water from the City of

Turlock WWTP for all of its non-potable operational requirements **no later than May 31, 2006**. Until this deadline, potable water supplied by the City of Turlock may be used by the project not to exceed 1 mgd. After May 2006, potable water may be used as a back-up to recycled water in the event of an unexpected, unavoidable interruption, but total annual potable water use for the operation of WEC shall not exceed pre-project levels for the 18-acre site or 72 AFY whichever is lower. This water use shall be offset by an equivalent amount of water conservation by the district consistent with a Commission approved conservation plan. Written notification within 24 hours must be provided to the CPM in the event of disruption to the supply of recycled water and use of potable water for back-up.

Verification: In the annual compliance report, the project owner shall submit a report to the CPM that documents the previous year's actual potable and recycled water use on a monthly basis consistent with requirements of **Condition of Certification SOILS&WATER 6**, distinguishing sources of water and their uses. Annual average will be calculated using actual project water use over consecutive five-year increments starting with the first year of operation.

SOILS&WATER 6: Prior to the use of any water by the WEC, the project owner shall install metering devices as part of the water supply and treatment system to monitor and record in gallons per day, 1) total volumes of each potable and recycled water supplied to WEC, and 2) volumes used of each source for cooling purposes, non-cooling process water supplies, irrigation, wash water, demineralized water and turbine injection. These metering devices shall be operational for the life of the project.

An annual summary of daily water use by WEC, differentiating between potable and recycled water and the uses of each at WEC, shall be submitted to the CPM in the annual compliance report.

Verification: No less than 60 days prior to the start of operation of WEC, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on the pipelines serving the project. These metering devices shall be capable of recording the quantities in gallons of water delivered to WEC and differentiate between uses of these supplies by WEC in order to report daily water demand (including irrigation). The project owner shall provide a report on the servicing, testing and calibration of the metering devices and operation in the annual compliance report.

The project owner shall submit a water use summary report to the CPM in the annual compliance report for the life of the project. The annual summary report shall be based on and shall distinguish recorded daily use of potable and recycled water for all project uses, including landscape irrigation. The report shall include calculated monthly range, monthly average, and annual use by the project in both gallons per minute and acre-feet. For subsequent years this information shall also include the yearly range and yearly average water used by the project.

SOILS&WATER 7: Wash wastewater resulting from periodic cleaning of the compressors and heat recovery steam generators shall be contained on-site in a

sump with the contents of the sump periodically pumped out by a vacuum truck and transported off-site for disposal at an appropriately licensed facility.

Verification: The project owner, in the annual compliance report, shall provide an accounting summary of the quantity and quality of wash and chemical cleaning water contained on-site, including the frequency of pumping, and the volume of water transported off-site for disposal. The accounting shall include documentation of the analytical reports required for disposal, and pre-treatment processing, if required for disposal.

SOILS&WATER 8: Surface or subsurface disposal of process wastewater or contaminated stormwater from WEC is prohibited. The project owner shall treat all appropriate wastewater streams with a zero liquid discharge (ZLD) system that results in a residual cake solid waste.

Verification: Within 60 days following the commencement of project operations, the project owner shall submit to the CPM the final design of the zero liquid discharge system, including schematic, narrative of operation, maintenance schedules, on-site storage facilities, containment measures and influent water quality. This information shall also include the results of the Waste Extraction Test of the residual cake solid waste from the zero liquid discharge system. In the annual compliance report, the project owner will submit a status report on operation of the zero liquid discharge system, including disruptions, maintenance, volumes of interim wastewater streams stored on-site, volumes of residual cake solids generated and the landfills used for disposal. In the event of ZLD system shutdown or any maintenance affecting the ability for WEC to continue treatment at the rate of its production of wastewater, WEC shall shut down until the ZLD system is restored to full operation.

REFERENCES

CH2Mhill, Sacramento, California (CH2Mhill) 2003b. Data Response, Set 1A. Submitted to the California Energy Commission on February 18, 2003.

CH2Mhill, Sacramento, California (CH2Mhill) 2003c. Data Response, Set 1B. Submitted to the California Energy Commission on February 25, 2003.

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CH2Mhill, Sacramento, California (CH2Mhill) 2003e. Data Response, Set 1D. Submitted to the California Energy Commission on March 10, 2003.

Kavarian 2003. Personal Communication with Mike Kavarian, Turlock Irrigation District, April 16, 2003

Madden 2003a. Personal Communication with Dan Madden, City of Turlock, April 11, 2003.

Madden 2003b. Personal Communication with Dan Madden, City of Turlock, May 7, 2003.

Master Environmental Assessment, Turlock General Plan MEA/DEIR, City of Turlock, September 1992, Reviewed 2002.

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Turlock Irrigation District, Turlock, California (TID) 1997. Turlock Groundwater Basin Groundwater Management Plan, Stanislaus and Merced Counties, Turlock Irrigation District, October 14, 1997.

Turlock Irrigation District, Turlock, California (TID) 2002a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 19, 2002.

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TRAFFIC AND TRANSPORTATION

Mark R. Hamblin and Eileen Allen

INTRODUCTION

The Traffic and Transportation Section of the Preliminary Staff Assessment (PSA) addresses the extent to which the project may affect the transportation system within the vicinity of the proposed Walnut Energy Center (WEC) project location. The influx of large numbers of construction workers can, over the course of the construction phase, increase roadway congestion and also affect traffic flow. In addition, the transportation of large pieces of equipment can affect roadway congestion and safety. The construction of linear facilities (such as pipelines for water service) can temporarily disrupt traffic flows when trenching is required in or across roadways.

Refer to the **PROJECT DESCRIPTION** section of this PSA for a more detailed discussion of the project.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

This section describes federal, state, regional, and local traffic and transportation laws, ordinances, regulations, and standards (LORS) applicable to the proposed project.

FEDERAL

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

- 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; and
- 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.

The California Vehicle Code limits apply to all surface streets and state highways. These limits are 20,000 pounds per axle and 10,500 per wheel or wheels on one end of the axle. The front steering axle load is limited to 12,500 pounds.

The California Health and Safety Code addresses the transportation of hazardous materials. Specific provisions include:

- California Vehicle Code, section 353 defines hazardous materials. California Vehicle Code, sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon;
- California Vehicle Code, sections 31600-31620, regulates the transportation of explosive materials;
- California Vehicle Code, sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements;
- California Vehicle Code, sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases;
- California Vehicle Code, sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways;
- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-.7, 34506, 34507.5, 34510, and 34511, regulates the safe operation of vehicles, including those which are used for the transportation of hazardous materials;
- California Health and Safety Code, sections 25160 et seq., addresses the safe transport of hazardous materials;
- California Vehicle Code, sections 2500 to 2505, authorizes the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives;
- California Vehicle Code, sections 13369, 15275, and 15278, address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials;
- California Streets and Highways Code, sections 117 and 660 to 672, and California Vehicle Code sections 35780 et seq., require permits for the transportation of oversized loads on county roads; and
- California Street and Highways Code, sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.

LOCAL

City of Turlock General Plan -Transportation Element (2001)

City of Turlock - Standards for Traffic Service Analysis

- Policy 5.1-c states that the City will strive to maintain Level of Service (LOS) C for all freeways and expressways. Level of Service is to be evaluated on the basis of either the Highway Capacity Manual, or other means approved by the City's Engineering Division of Municipal Services.

- Policy 5.1-d establishes an LOS D as an allowable standard for arterial and collector streets where existing conditions limit improvements. City General Plan traffic forecasts indicate that the following street segments may operate at Service Level D upon buildout of the City of Turlock's General Plan in 2021: Monte Vista Avenue between SR (State Route) 99 and Walnut Avenue and SR 99 between Main Street and Monte Vista Avenue.
- Policy 5.1-e states that the City recognizes that its land use pattern, limited number of continuous north-south streets, and the concentration of traffic activity on the east side of the freeway will result in very poor service levels on a small number of streets where capacity cannot be increased because it would create unacceptable disruption.
- Policy 5.1-f states that on streets noted in Policy 5.1-e where poor service levels are anticipated, the City staff would investigate and implement projects, which will improve traffic operations. Measures such as parking prohibitions, turn prohibitions and minor widening will be evaluated on streets where existing development makes major widening projects unacceptable.

Truck Movement

- The City requires an oversized load permit when the vehicle exceeds 102 inches wide, 14 feet tall and 40 feet in length or 65 feet combined length.

SETTING

REGIONAL DESCRIPTION

The proposed Walnut Energy Center site is located within the City of Turlock in Stanislaus County, California. The critical roads and highways in the project area are described below.

Freeways and Local Roadways

The circulation network diagram (**TRAFFIC AND TRANSPORTATION - Figure 1)** shown in the City of Turlock's General Plan, Transportation Element, identifies the functional classifications of key routes. The circulation map distinguishes existing or proposed alignments. A route's design, including the public right-of-way (ROW) width and number of lanes needed, is determined both by its classification as well as the projected traffic level on the street.

State Highway 99 is located about 2.7 miles east of the WEC site. It is a north-south freeway maintained by the State of California. Highway 99 provides regional access to San Joaquin Valley communities. The freeway consists of six mixed-flow lanes that can be used by any vehicle.

South Washington Road is classified as an "expressway[1]" by the City of Turlock Transportation Element. It is a north-south public right-of-way that currently ranges

[1] The right-of-way width for expressways varies from 100 to 110 foot. Access standards for this designation consist of the following minor access restrictions: left turns to/from occasional collector

between 40-50 feet (approx.) in width that contains a two-lane paved road. The paved lanes are approximately 24 feet in width. The posted speed limit for this road is 45 miles per hour. The road is designated a "Truck Route" by the City. South Washington Road becomes North Washington north of Main Street.

West Main Street is an east-west public right-of-way that currently ranges between 60-80 feet (approx.) in width that contains two paved lanes approximately 24 feet in width. West Main Street is designated a "major arterial[2]" by the City of Turlock. This roadway provides egress and ingress to the City of Turlock and State Highway 99. West Main Street also serves as a county junction outside of the City's jurisdictional boundary. The posted speed is 45 miles per hour. The street is also designated a "Truck Route" by the City.

West Linwood Avenue is an east-west 40-50 foot wide (approx.) public right-of-way that contains a two–lane paved road with each lane approximately 24-feet in width. West Linwood Avenue is designated by the City as a "minor collector[3]".

West Harding Road is currently a 40-foot (approx.) wide east-west public right-of-way that contains a two-lane paved road. The paved lanes are approximately 24-foot in width. The City designated West Harding Road as an "expressway."

South Tegner Road is a north-south public right-of-way with a width that currently ranges between 65-75 feet (approx.) that contains a two-lane paved road. The paved lanes are approximately 24-feet in width. A portion of the road is shown as an "arterial." The remainder of the road is designated as a "minor collector."

Ruble Road is an east-west 40-foot (approx.) wide public right-of-way that contains a single paved lane approximately 20 feet in width. The road is approximately 1265 feet in length. The road is surfaced with asphalt. At the end of Ruble Road there is an additional 1300 feet (approx.) of deteriorated roadway, with several unpaved, dirt sections. This is a private road, approximately 20-30 feet wide, which is not maintained by the City. (see **TRAFFIC AND TRANSPORTATION - Figure 2, Pictures 3 and 4**).

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streets allowed; at signalized intersections, the expressway will receive 55-65 percent of the green time. Design Speeds: 45-50 mile per hour. All expressways in the City's planning area are classified as Class C. Source: City of Turlock General Plan – Transportation Element, 2001, Table 5.2-A Street Classifications, 2001.

[2] Arterial collects and distributes traffic from freeways and expressways to collector streets, and vice versa. Right-of-Way: 100-110 foot that carries two to three lanes of traffic in each direction and provides for a left turn median. Source: City of Turlock General Plan – Transportation Element, 2001, Table 5.2-A Street Classifications, 2001.

[3] Major and Minor Collectors - Major collectors consist of one of two designs: 1) a major collector can carry four lanes of traffic within an 84 foot right-of-way, or 2) a major collector can carry four lanes of traffic and two bicycle lanes within a 94 foot right-of-way.

Minor collectors consists of one of two designs: 1) a minor collector can carry two lanes of traffic within a 60-foot right-of-way, or 2) a minor collector can carry two lanes of traffic with bicycle lanes within a 70-foot right-of- way. Source: City of Turlock General Plan – Transportation Element, 2001, Table 5.2-A Street Classifications, 2001.

South Commons Road is a north-south 40-50 foot (approx.) public right-of-way that contains two paved lanes each 24-foot (approx.) in width. The City designates the road as a “collector.” The City also designates a portion of this road as an “arterial.” The Stanislaus County General Plan, Circulation Element classifies the road as a “collector.”

South Walnut Road is a north-south 25-50 foot (approx.) public right-of-way that contains two paved lanes each approximately 24-foot in width. The City designates the road as an arterial. The road is also designated as a “Truck Route”.

Airport

The City of Turlock owns the Turlock Municipal Airport, which is located approximately 11.5 miles east of the WEC site in Merced County along East Avenue and Newport Avenue.. The City acquired the airport in the late 1940s through a transfer from the federal government under the Surplus War Property Act of 1944. Since that time the City has managed and operated the airport as a small general aviation facility. The airport property consists of approximately 250 acres. The airport has an approximate 3,000-foot long runway. The airport’s annual number of take-offs and landings is estimated to be 15,000. The City provides administrative support in the form of rental of tie-downs, hangar spaces and the collection of monthly rental/lease fees.

The Turlock Air Park is a small privately owned facility located in the southern part of the City, approximately three and a half miles southeast of the WEC site. The air park is primarily used by ultra-light aircraft and radio-controlled model airplanes. The air park is subject to aircraft use and size restrictions due to its location adjacent to State Highway 99. Flight operations occur on an infrequent basis at the air park.

Railroad

The Union Pacific Railroad operates an active main line along the north border of the WEC property. The Union Pacific Railroad is used primarily for freight service. An existing railroad spur is to be used for transporting construction materials and/or equipment during the construction phase of the project.

Public Transit

The City maintains a bus system known as the Bus Line Service of Turlock (BLAST). The service has two loop routes. Each loop requires 50 minutes. Routes operate between 7:00 a.m. and 6:25 p.m.

The City also operates a transit service called Dial-A-Ride-Turlock (DART). DART offers door-to-door transit to disabled residents who live within the Turlock transit service area.

The Modesto Turlock Stage is an intra-county transit operated by Stanislaus County Transit. The Modesto Turlock Stage is a bus service between Modesto and Turlock with connections to the communities of Ceres, Keyes and Denair.

Greyhound Bus Lines is the single inter-regional bus company that serves the City of Turlock.

Residents of Turlock are served by passenger railroad service. Amtrak uses the Santa Fe Railroad tracks through the community of Denair, located east of the City of Turlock.

Bicycle Facilities

The City of Turlock Transportation Element, “Bikeways & Trails” map shows a proposed bicycle trail parallel to the Union Pacific Railroad tracks along the north border of the WEC site. The trail extends to the east to Lander Avenue. The trail extends to the west beyond South Washington Road and then forks into north and south trails. Staff was not able to determine when this trail may be constructed.

PLANNED ROADWAY AND TRANSIT IMPROVEMENTS

The City of Turlock’s Engineering Services - Current Construction and Projects Out to Bid web pages show that there are no relevant roadway or transit improvement projects proposed within the immediate vicinity of the WEC project site during its construction period. Staff’s May 2002 attempts to verify and update this web page information via telephone calls have not produced a result yet. The City’s Transportation Element notes that West Main Street, between State Highway 99 and Tegner Road, currently a 2-lane major arterial, is scheduled to be improved to a four-lane major arterial at sometime in the future depending on the City’s budget.

OPERATING CONDITIONS OF THE ROAD AND HIGHWAY SYSTEM

EXISTING SURFACE STREET OPERATING CONDITIONS

The operating conditions of a roadway (surface street) system, including intersections, 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. LOS can range from “A,” representing free-flow conditions with little or no delay, to “F,” representing saturated conditions with substantial delay.

Traffic and Transportation - Table 1 - Roadway Level of Service Existing Conditions - shows proposed surface street travel routes and current service levels as presented by the applicant in the traffic and transportation section of the Walnut Energy Center Application For Certification (AFC).

TRAFFIC AND TRANSPORTATION- Table 1
Roadway Level of Service Existing Conditions

		Existing			Future, No Project Conditions (2005)			
Roadway	Hourly Design Capacity[a]	Average Daily Volume[b]	PM Peak Hour Volume[c]	PM Peak Hour LOS[d]	Estimate Truck Percent-age	Estimate Daily Volume	Estimate PM Peak Hour Volume	Estimate PM Peak Hour LOS
West Main St.	1,800	7,425	745	B	17	8,866	890	C
S. Washington Rd.	1,400	1,853	185	A	7	2,213	225	A
W. Harding Rd.	1,400	432	45	A	10	516	55	A
S. Walnut Rd.	1,400	7,765	780	B	10	9,272	930	C
S. Tegner Rd.	1,400	1,221	125	A	10	1,458	145	A
W. Linwood Ave.	1,400	8,712	875	C	10	10,403	1,040	C
Clayton Rd.	1,400	1,076	110[e]	A	N/A	1,247	125[e]	A
S. Commons Rd.	1,400	327	33[e]	A	27	379	38[e]	A
Bradbury Rd.	1,400	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A = Data not available
[a]Maximum number of vehicles per hour in both directions for LOS E.
[b]Estimated number of vehicles per day in both directions.
[C]Vehicles per hour in both directions.
[d]LOS based on Highway Capacity Manual methods (Transportation Research Board 2000).
[e]Estimated as 10 percent of daily.
Future projections are based upon a 3 percent growth factor from existing conditions.

Source: Application For Certification, Vol. 1, Table 8.10-7, November 18, 2002

As shown in Table 1 (above) there are no surface streets identified within the vicinity of the project that are operating below LOS D.

Existing State Highway 99 Operating Conditions

A six-lane segment of State Highway 99 passes through the western section of the City of Turlock to the Merced County line. Within the City there are five highway interchanges. Caltrans has recently completed turn lane work at the State Highway99/Main Street highway interchange. Future widening of this interchange is to occur within the next 10 years.

On April 11, 2003, staff talked to the Caltrans District 10 Road Superintendent regarding average daily traffic and traffic congestion on State Highway 99 within the City of Turlock (Caltrans, 2003). The Road Superintendent stated that there is a small amount of traffic congestion during the weekday morning peak travel time for vehicles traveling on West Main Street east onto northbound State Highway 99. Vehicles traveling south on State Highway 99 exiting at the highway interchange on to Main Street during the evening peak does not present a traffic congestion problem. Many travelers that use the highway who reside within the City exit at Taylor Road and travel east to an existing residential area.

Truck Traffic

Many trucks traveling in the vicinity of the project serve existing industrial land uses in the immediate area. The designated truck routes within the City of Turlock, as shown in the City's Transportation Element, primarily follow the City's designated expressway and arterial street system (see **TRAFFIC AND TRANSPORTATION** - **Figure 3**).

TRAFFIC AND TRANSPORTATION RELATED PROJECT FEATURES

MAIN ACCESS ROAD TO FACILITY

The WEC facility site is to be served by at least a 20 foot wide, 1,900 foot long access road that is to span from the east side of South Washington Road to the WEC site. The access road is to serve as the main entrance to the facility. The access road is to be located approximately 1,600 feet south of the intersection of South Washington Road and West Main Street (see **TRAFFIC AND TRANSPORTATION – Figure 2, Picture 2**).

SECONDARY ACCESS ROAD TO FACILITY

The applicant has proposed construction of a second access road, which would be used in the case of an emergency. The second access road would be built approximately 250 feet south of the facility site, and connect to an unpaved private road that extends to Ruble Road (see **TRAFFIC AND TRANSPORTATION – Figure 2, Pictures 3 and 4**).

NATURAL GAS PIPELINE

The WEC project includes the construction of a 3.6-mile eight-inch natural gas pipeline. The pipeline will connect with PG&E's Line 215 at West Bradbury Road, south of the City of Turlock. The pipeline will run north from the intersection of West Bradbury Road and South Commons Road approximately 2.7 miles along South Commons Road to the Union Pacific Railroad tracks. The pipeline will turn east, paralleling the south side of the railroad track for .9 of a mile to the WEC site (see **TRAFFIC AND TRANSPORTATION - Figure 4**).

POTABLE WATER SUPPLY LINE

Potable water to service the WEC is to be obtained from the City of Turlock. Potable water is to be supplied by the installation of an approximate 8-14 inch diameter pipeline from a potable water main located at the intersection of South Tegner Road and Ruble Road. The pipeline will span 3,350 feet westward along Ruble Road and a private road. The pipeline will then turn north crossing approximately 250 feet into the facility site (see **TRAFFIC AND TRANSPORTATION - Figure 4**).

RECYCLED WATER SUPPLY LINE

The City of Turlock will provide recycled water to serve the project. The pipeline route will originate at the City's regional wastewater treatment facility. The line will travel north 350 feet along South Kilroy Road, then west 2,625 feet (approx.) across privately owned land to Tegner Road, north 1,000 feet on Tegner Road to Ruble Road, west 3,350 feet on Ruble Road and a private road, then north 250 feet on to the facility site (see **TRAFFIC AND TRANSPORTATION - Figure 4**).

TRANSMISSION LINES

The interconnection between the proposed WEC and the Turlock Irrigation District transmission system will require two new double-circuit overhead lines extending approximately 1,950 feet and 670 feet to loop the Walnut-Hilmar 115-kV and the Walnut Industrial 69-kV Line 2 transmission lines into the WEC switchyard (see **TRAFFIC AND TRANSPORTATION - Figure 4**).

ANALYSIS AND IMPACTS

In order to determine whether there is a potentially significant impact generated by a project, staff reviewed the project in light of the following criteria found in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (Title 14, California Code of Regulations, §15000 et seq.):

- traffic levels, particularly any increases that are substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- level of service standards established for roads and highways;
- hazards due to a design feature (e.g., sharp curves or dangerous intersections);
- emergency access; and
- parking capacity.

In the Project Specific Effects portion of this analysis, staff discusses the above items found in the traffic section of Appendix G. Although not an Appendix G item, staff also discusses the potential traffic and transportation impacts of oversize and overweight loads in the Facility Construction section. Emergency access and parking capacity are also discussed in the Facility Construction section, since potential impacts in those areas are most applicable to the construction phases. Hazards to the public or the environment through the routine transportation of hazardous material and changes to air traffic patterns are discussed in the Operational Impacts section since potential impacts in those areas more commonly occur when a generating facility is operating.

PROJECT SPECIFIC EFFECTS

This section presents the potential for increased traffic associated with construction and operation of each feature of the WEC project as presented in the applicant's traffic and transportation section of the Application for Certification (AFC). This project information may be modified by the submittal of new traffic/transportation information by the applicant, City, County, an interested agency and/or members from the public. Verified information by staff may be incorporated into the project's Final Staff Assessment (FSA).

Facility Construction

Plant Site Workforce

The applicant is expecting to employ most of the construction workforce from the cities of Turlock and Modesto in Stanislaus County and Merced County. Construction of the WEC is expected to take a total time of 20 to 24 months. The peak construction workforce level is expected to occur during months 11 through 19 of the construction period. Construction will generally be scheduled to occur between the hours of 7 a.m. and 7 p.m., Monday through Friday.

The applicant has estimated a peak construction workforce of approximately 205 workers per day. The AFC states that during the peak construction period, generating facility construction workers will generate an estimated 315 daily trips. Staff attempted to verify the applicant's calculations, using an Average Vehicle Occupancy (AVO) multiplier of 1.3, which was contained in the AFC. When 205 workers are multiplied by 1.3, the result is 266.5 rather than 315. If 205 workers were making 315 daily trips, with 205 being approximately two-thirds of 315, staff assumes that approximately one-third of the workers would be expected to carpool. Based on staff's experiences with other power plant cases in areas with an abundant labor pool such as the Central Valley, staff believes that this assumption is reasonable. The AFC states that 158 trips are estimated to occur during the evening peak hour.

During the non-peak construction period, the applicant estimates the average daily construction workforce to be 114 workers. Using the same carpooling assumption as that employed for peak period trips (i.e., one-third), the workers will generate an estimated 175 average daily vehicle trips. The potential impact of these peak and non-peak daily construction trips is discussed below in the Level of Service section.

Level of Service

The applicant assessed whether levels of traffic congestion could increase as a result of construction worker commute trips being added to existing traffic volumes on surface streets within the vicinity of the project.

TRAFFIC AND TRANSPORTATION - Table 2, Roadway Level of Service – Expected During Project Conditions shows the proposed travel routes and estimated traffic situations during project conditions as presented by the applicant in the AFC.

TRAFFIC AND TRANSPORTATION - Table 2
Roadway Level of Service – Estimated During Project Conditions

	Future Project Conditions During Construction (2002–2005)				Future Project Conditions During Operation (2005)			
Roadway	Estimated Daily Construct-ion Trips[a]	Combin-ed Daily Traffic (with Est. Daily Construct-ion Trips)	Combined PM Peak Traffic	Estimat-ed LOS	Estimat-ed Increase In Daily Volume[b]	Estimat-ed Daily Volume	Estimat-ed PM Peak Traffic	Estimat-ed LOS
West Main St. (West of S. Washington Rd.)	471	7,896	973	C	42	8,929	890	C
S. Washington Rd. (South of W. Main St.)	471	2,324	413	A	42	2,276	225	A
W. Harding Rd. (West of S. Washington Rd.)	471	903	273	A	42	581	60	A
S. Walnut Rd.	471	8,236	1008	C	42	9,336	935	C
S. Tegner Rd.	471	1,692	353	A	42	1,521	150	A
W. Linwood Ave. (S. of S. Walnut Rd.)	471	9,183	1,103	C	42	10,466	1,045	C
Clayton Rd.	471	1,547	338	A	42	1,289	146	A
S. Commons Rd.	471	789	261	A	42	421	59	A
Bradbury Rd	471	N/A	N/A	N/A	42	N/A	N/A	N/A

[a] Estimated Peak Daily Construction Trips, Peak Construction Workers, including truck trips (20 per day) and construction traffic approximately 136 per day and 36 in the evening peak for linear facilities (water, natural gas and transmission), would equate to 471 daily and 228 in the p.m. peak.
[b] Total increase in daily volume is 21 vehicles, assumed to be distributed evenly among the routes shown.

Source: Application For Certification, Vol. 1,Table 8.10-7, November 18, 2002 and Response to Data Request, pg. 16, February 18, 2003.

The applicant has calculated 471 estimated peak period daily construction trips to be generated by the project as explained in superscript "a" in the table above. However, using the information in the traffic and transportation section of the AFC, staff's calculations for the estimated daily construction trips are as follows:

315 - estimated peak daily construction trips
20 - estimated peak daily truck trips
+ 110 - estimated daily construction trips for linear facilities = (48 trips for the potable & recycle water supply lines + 56 trips for the natural gas line + 6 trips for the transmission lines)
445 - estimated peak period daily construction trips generated by the project

The applicant shows 42 as the Estimated Increase In Daily Volume during the operation of the WEC for 2005 in the table above. As identified within Table 2 (Estimated Increase In Daily Volume and superscript “b”) the applicant estimates 21 vehicles making 2 trips per day generating a total increase of 42 daily trips on to the surface street system at WEC operation.

Although staff has not been able to reconcile calculations based on the data found in the AFC’s traffic and transportation section and the Table 2, note subscript b, regarding the Estimated Daily Construction Trips during the peak period, staff is willing to use the applicant’s figure of 471 estimated daily construction trips. When staff combined the current low traffic volumes on the roadway segments shown in Table 1 with the project’s estimated 471 daily construction trips and 42 daily operational trips, staff’s agrees with the applicant’s conclusion that overall LOS levels would remain the same. Furthermore, the project’s temporary additions to local traffic would not cause the LOS for any roadway to deteriorate below LOS C, which would be above the City’s acceptable standard of D.

The applicant has indicated their intent to provide a construction traffic control plan that limits construction-period truck and project-related commute traffic to off-peak periods in coordination with the City of Turlock. In addition, this traffic control plan should include timing of linear facilities construction to take place outside peak traffic periods to avoid traffic flow disruptions.

State Highway 99

The State Highway 99/W. Main Street off-ramp has been identified in the AFC’s traffic and transportation section as part of the main travel route to be used by construction workers and truck deliveries to the WEC site. The WEC site is approximately 2.7 miles from State Highway 99. Also, use of State Highway 99/Taylor Road, Monte Vista Avenue or Fulkerth Road on/off ramps may be used. Taylor Road, Monte Vista Avenue, Fulkerth Road are designated truck routes by the City.

To assess whether the WEC’s potential traffic volumes would have an impact on level of service for State Highway 99, staff contacted Caltrans District 10. The District 10 Road Superintendent informed staff that District 10 does not calculate LOS levels, but they do monitor average annual daily traffic (AADT) counts. The Superintendent stated that traffic expected to be generated by the project’s commuting construction workers (i.e., 205 peak construction workers during months 11 through 19) and heavy truck deliveries (i.e.,20 peak daily deliveries during months 11 through 19) during the 20-24 month construction period would not require permanent impact mitigation for State Highway 99. A portable traffic signalization unit with a changeable message informing highway drivers to slow down due to truck traffic may be considered (Caltrans, 2003). Condition of Certification **TRANS-5** includes a requirement for pre-construction consultation with Caltrans’ staff on the need for a message sign unit.

Intersections

The City of Turlock’s Transportation Element calls for a service level standard of LOS D or better. As shown in Table 2, no road segments will be significantly impacted (i.e.

cause a location to be worse than relevant standard) by the project under existing plus project conditions.

South Washington Road/West Main Street Intersection

The South Washington Road/West Main Street intersection is the closest public road intersection to the WEC site. This intersection is approximately 1,600 feet north of the proposed private access road to serve the WEC. The intersection is a four-way stop. It also has a four-way flashing overhead red signal light. Staff visited this intersection during the late morning to mid-afternoon hours on March 6, 2003. During that time, the LOS for this intersection appeared to be a LOS C or better (evening peak was not observed) (see **TRAFFIC AND TRANSPORTATION – Figure 2, Picture4**).

To minimize the effect of traffic on local roads, staff has proposed that the applicant develop a traffic control plan; see proposed Condition of Certification **TRANS-5**.

Truck Traffic

Truck deliveries during the construction period will supply plant equipment and construction materials, such as cable, concrete, pipe, steel and fuel. The proposed commuting route to the construction site is anticipated to involve use of West Main Street and South Washington Road. West Taylor Road may be used. All three roads currently operate at LOS C or better. Also, these roads are designated truck routes. Construction traffic is not expected to diminish the LOS on these roadways to less than LOS D.

Truck deliveries of heavy equipment, construction materials and miscellaneous items are expected to occur between 7:00 a.m. and 7:00 p.m. The number of trucks expected during construction will average 8 to 10 truck deliveries per day. Estimated peak trips during the peak construction period is 20 trucks per day.

The proposed facility will sit near the end of a 1,900-foot access road on an 18-acre portion of a 69-acre property. Although left-turn lanes are not provided at this time for vehicles turning left into the site, excessive delays are not expected from this movement in consideration of the LOS C traffic on South Washington Road. No truck deliveries or parking will occur on South Washington Road.

Truck deliveries that occur during the construction and operation phase of the project should not have a problem making turning movements on-site after a delivery. Trucks would have adequate area to circle around within the proposed 23 acre (approx.) construction lay down area to head back out towards South Washington Road.

Railroad Activity

The applicant states that heavy-haul loads would be delivered to the project site by railroad. Union Pacific Railroad service is available. A main line is located approximately 150 feet north of the facility site. Rail spur lines are also near the project site. The applicant estimates that up to 40 rail cars will be used to deliver heavy or oversized items; such as the heat recovery steam generator modules, combustion turbines and generators, steam turbine and generator and generator step-up transformers.

Oversize and Overweight Loads and Road Conditions

The applicant has stated that it intends to use the Union Pacific rail line for transport of heavy and/or oversized components such as the turbines, which exceed the roadway load and size limits. In the event that oversize/overweight loads do need to be transported by truck , the applicant would require special permits from the City of Turlock and/or Caltrans, as required by proposed Condition of Certification **TRANS-1**. To ensure that the roadways are maintained, staff has proposed a condition of certification to require the applicant to repair roadway damage, if any, caused by construction activity, as required by proposed Condition of Certification **TRANS-7**.

Construction Worker Parking Area And Laydown/Staging Area

A construction worker parking area would be located on the 69-acre property where the WEC is to be constructed. The applicant has shown a 3.4-acre area for construction worker parking on a site plan (see **PROJECT DESCRIPTION** section). The applicant estimates the peak construction workforce to be 205 workers.

Staff used a conservative assumption to analyze the adequacy of space for parking, in which the applicant would provide one 9' X 18' parking space (a general parking space size) for each peak workforce construction worker (205), The applicant would need to provide at least a 33,210 square foot area (.76 ac.) plus suffficient area for a 20-foot wide travel lane(s) to service the parking area. Therefore, the applicant's proposed 3.4 acres could accommodate construction worker parking. Staff's proposed Condition of Certification **TRANS-4** requires that all project-related parking occur in designated parking areas, rather than on local roads and streets.

The construction laydown and staging area involves approximately 23.25 acres of the 69-acre property. Truck and rail service are to be used to deliver materials and equipment. Most major pieces of construction equipment: such as the heat recovery steam generator modules, etc., will be either kept on the construction site or the laydown/staging area during the construction period. The size of the area is expected to be adequate for the storage of materials and equipment.

Access Roads - Main and Secondary

In general, the Uniform Fire Code requires a minimum of a 20 foot wide vehicular access with all weather surfacing (e.g. crushed or decomposed granite, asphalt, etc.) for public roads. These roads must be capable of sustaining a 40,000 pound emergency service vehicle (the approximate weight of a fully loaded fire truck).
The applicant has proposed a main access road, and a secondary to be used for emergencies. These proposed roads are described in the Traffic and Transportation Project Features section. The second access road would extend south from the facility site for approximately 250 feet, and connect to an unpaved private road that extends to Ruble Road (see **TRAFFIC AND TRANSPORTATION – Figure 4**).

The applicant will need to obtain a vehicular access easement from an adjoining property owner in order to travel across their property (use the private road). Also, the applicant may have to execute a maintenance agreement for the vehicular access easement in order to be allowed to conduct maintenance and repairs to the private road

and continue to make it accessible for emergency services vehicles. Staff has proposed Condition of Certification **TRANS-6** to address the potential vehicle access easement concern.

Construction of the secondary access road, its connection to the existing private road, improvements to the private road and potential improvement to Ruble Road will temporarily affect traffic flow and access to properties by individuals that use Ruble Road and the private road. Nine residences and one commercial business (a dairy construction company) use Ruble Road and/or the private road. Staff has proposed Condition of Certification **TRANS-5** to address potential traffic flow concerns.

Emergency Service Access

The closest fire station to the project site is the City of Turlock Fire Services Station No. 2 at 791 South Walnut Road in the City of Turlock. This station is approximately two miles east of the WEC site. Travel from this station to an emergency would most likely involve use of West Linwood Avenue and South Washington Road. Turlock Fire Services Station No. 4 is located at 2820 North Walnut Road, which is approximately three miles northeast of the site within the city limits.

The nearest medical facilities to the site are Emanuel Medical Center and Stanislaus Medical Center. Both facilities are located in the City of Turlock on Delbon Avenue approximately five miles from the project site.

The facility's proposed main access and a secondary access will provide entry for emergency service vehicles to the facility site. On-site, emergency service vehicles will be able to use a paved internal access to buildings and equipment. Areas around equipment that are not paved will have gravel surfacing to support vehicles.

The local roads in the vicinity of the WEC site have minimal traffic congestion levels, with LOS expected to remain at C or above. Staff concludes that the project's construction, including construction workforce commuting activity and truck traffic, would not affect emergency access to the plant site.

For a discussion on emergency services within the facility, read the **WASTE MANAGEMENT, WORKERS SAFETY AND FIRE PROTECTION** and **HAZARDOUS MATERIALS** section of this report.

Hazards Due To A Design Feature

The WEC's proposed main access road connection (apron) to South Washington Road is to be located approximately 1,600 feet south of the intersection of South Washington Road and West Main Street. The apron location is not visually obstructed for at least 1,000 feet to its north (absent any train) and to the south. The main access road is approximately 250 feet south of a Union Pacific Railroad crossing that is signalized and has safety crossing arms.

South Washington Road is designated as an expressway. The expressway is used by a variety of heavy vehicle types: milk tank trucks, tractor-trailer rigs, school buses, etc.). It has minor access restrictions and a posted speed of 45 miles per hour.

The proposed main access road connection to South Washington Road and its proposed secondary access do not present any traffic/transportation design hazards or features that would adversely affect WEC construction or operation phases.

School Bus Travel

Staff talked with a representative in the transportation department of the Turlock High School District. Staff was informed that a high school bus travels on West Main Street to the intersection of South Washington Road and West Main Street at 6:30 a.m. and 3:05 p.m. The District does not conduct bus operations on South Washington Road south of the intersection with West Main Street.

Chatom Elementary School is approximately five miles west of the facility site. Chatom Elementary School is within the Chatom Union School District. Staff spoke with the Transportation Supervisor for the elementary school. She stated that that the school conducts bus operations on South Washington Road, south of the intersection with West Main Street between 6:45 – 7:45 a.m. and 2:00 – 4:15 p.m. Two bus stops are located on the west side of South Washington Road, south of the Union Pacific Railroad tracks. She said if the elementary school is provided a minimum of a ½ day advanced notice of a proposed road closure or temporary influx of construction workers, the District can alter their bus route (Chatom Elementary School, 2003).

The current morning school bus times overlap the 7:00 project construction start time. Therefore, proposed Condition of Certification **TRANS-5** requires that the applicant consult with the School District regarding a construction workforce travel route and/or school bus routes, and project truck delivery times, that would eliminate the possibility of a traffic safety hazard for school children.

Linear Facilities

Natural Gas Pipeline

The installation of the pipeline is anticipated to use a 250 foot construction corridor in order to provide flexibility to locate the pipeline on either side of South Commons Road and the railroad tracks. The actual pipeline area of disturbance is 50-75 feet. Construction primarily will be open trench.

The installation of the pipeline will require a peak workforce of approximately 36 people. The pipeline installation is to be completed over a period of three to five months. During the peak construction period, using an assumption that approximately one third of the workers will carpool, construction workers will generate an estimated 56 daily trips. 28 of these trips would occur during the evening peak time period.

Construction of the pipeline will take place within the public right-of-way and will temporarily impact traffic flow. Staff has proposed Condition of Certification **TRANS-5** to address potential traffic flow concerns.

Potable and Recycled Water Supply Lines

Construction of a new potable water pipeline and a recycled water supply line are proposed for the project (see **TRAFFIC AND TRANSPORTATION - Figure 4)**. Construction of the pipelines is expected to begin towards the end of the first year after the start of construction for the facility. Total construction time is expected to be four to five months.

Potable water to service the WEC (i.e., plant service, fire protection) is to be obtained from the City of Turlock. The installation of the potable water pipeline is expected to involve a 100 foot construction corridor. This width will provide flexibility in determining the location of the line within the corridor. The installation of the pipeline will disturb a 50-75 foot wide area. The pipeline is to be owned and operated by the City.

The City of Turlock will provide recycled water to the project. The installation of the recycled water pipeline is anticipated to use a 250 foot construction corridor. The pipeline's actual area of disturbance is 50 to 75 feet. The recycled water pipeline is to be owned and maintained by the City.

Construction of the potable and recycled water pipelines and related facilities will require a peak workforce of approximately 18 people. During the peak construction period, using an assumption that approximately one third of the workers will carpool, construction workers will generate an estimated 48 daily trips. 24 of these trips would occur during the evening peak time periods.

Construction of these water pipelines will take place within the public right-of-way. Staff has proposed Condition of Certification **TRANS-3** to ensure that the applicant obtain encroachment permits from the City of Turlock, to minimize temporary traffic disruption resulting from work to be conducted within the public right-of-way.

Construction of the pipelines may affect traffic flow along several surface streets and a private road. Staff has proposed Condition of Certification **TRANS-7** to ensure that local roadways are returned to as near to original conditions as possible after construction activity.

Also, the applicant will need to obtain a pipeline repair and maintenance easement from a property owner to cross private property at the end of Ruble Road.

Transmission Lines

A proposed 69-kV double-circuit line will leave the WEC site proceeding south approximately 670 feet to intersect with the existing Walnut Industrial 69-kV Line 2 transmission line. One existing line travels approximately 4,500 feet west and then north along S. Washington Road to the Walnut substation. The other existing line terminates approximately 1.7 miles to the southeast at the Industrial substation.

New lines will extend from an existing transmission line right-of-way to service the facility. No transmission work is being performed within the right-of-way of an existing public thoroughfare.

Construction of the 69-kV and 115-kV transmission lines will require a peak workforce of approximately 20 people. Construction workers will generate an estimated six daily trips, none of which will occur during the evening peak time periods. Construction work hours are to be between the hours of 7:00 a.m. and 3:30 p.m. The installation of the new transmission lines will be completed over a three to four month period.

The applicant has stated that during the construction period, WEC construction workers will meet at the laydown/staging area and travel together to the work site in crew trucks. As previously noted, Condition of Certification **TRANS-5** requires the applicant to develop a traffic control plan for the project prior to the start of construction. The resulting impact to traffic flow due to the installation of transmission lines for the project would be less than significant.

Operational Impacts

Employee Traffic

The applicant is proposing to hire 21 permanent employees. The 21 employees will not all be on-site at the same time, since facility operators will work on 12 hour shifts. The standard work shift for maintenance technicians and administrative positions is eight hours per day, 7 a.m. to 3:30 p.m., 5 days per week, with unscheduled days and hours as required (i.e., weekends, holidays, etc.). During the day, 11 staff will be at the WEC. As shown in Table 2, operation of the day and night permanent employee shifts is estimated to generate 42 vehicle trips per day.

South Washington Road currently has an LOS A. West Main Street has an LOS C. Though the project's permanent employees will generate additional daily vehicle trips this increase is not expected to diminish these roads' service level to less than LOS C (see **TRAFFIC AND TRANSPORTATION –Table 2**).

Truck Traffic

Truck deliveries to the WEC are expected for the on-going operation and maintenance of the facility. During facility operations, trucks will periodically deliver/pickup: lubricants, replacement parts, water treatment chemicals, anhydrous ammonia, sulfuric acid, trash and other consumables. On average, there will be three truck trips to the WEC per day during operation (see **TRAFFIC AND TRANSPORTATION – Table 3** below). Though the project will generate additional truck traffic the increase is not expected to diminish the service level on South Washington Road and West Main Street to less than LOS C (see **TRAFFIC AND TRANSPORTATION –Table 2**).

TRAFFIC AND TRANSPORTATION – Table 3
Estimated Truck Traffic
During WEC Operation

Delivery Type	Number and Occurrence of Trucks
Anhydrous ammonia	1 to 2 per month
Sulfuric acid	2 per month
Cleaning chemicals	1 per month
Trash pickup	1 per week
Salt cake from zero liquid Discharge process	5 per week
Lubricating oil	4 per year
Lubricating oil filters	4 per year
Laboratory analysis waste	4 per year
Oily rags	4 per year
Oil absorbents	4 per year
Water treatment chemicals	4 per week
Source: Application For Certification, Table 8.10-8. November 18, 2003	

Hazardous Materials

The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. As previously noted, on average there will be three truck trips to the project site per day. Hazardous material transport to the facility can be mitigated to insignificance by compliance with existing federal and state standards established to regulate the transportation of Hazardous Substances (see staff proposed Condition of Certification **TRANS-2**).

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

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) legally 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.

The applicant has indicated that the transportation of hazardous materials to and from the site will be conducted in accordance with all applicable LORS for the handling and transportation of hazardous materials.

The handling and disposal of hazardous substances are also addressed in the **WASTE MANAGEMENT, WORKERS SAFETY AND FIRE PROTECTION** and **HAZARDOUS MATERIALS** sections of this report.

Air Traffic Patterns

The Walnut Energy Center is not located within the vicinity of a major general aviation facility (e.g. Sacramento International Airport). Turlock Municipal Airport is the closest general aviation facility. The airport is approximately eleven and a half miles to the east of the proposed WEC site. The airport has a 2,985 foot long X 50 foot width runway.

The applicant is not required to file a Notice of Proposed Construction Or Alteration with the Federal Aviation Administration (FAA), since the WEC does not have any structure exceeding 200 feet in height.

Visible Plumes- Potential Impact on Air and Road Traffic Safety

The **VISIBLE PLUME ANALYSIS** section in this report provides the model analysis conducted for exhaust stack visible plumes potentially generated by the Walnut Energy Center's cooling tower and heat recovery steam generator (HRSG).

According to this analysis, the visible plumes from the WEC cooling tower are expected to occur greater than 10% of seasonal (November through April) daylight clear hours. A plume frequency of 10% of seasonal daylight clear hours is used as a plume impact study threshold trigger. A visible plume formation will occur predominantly during the cold weather months, with the majority of plume formation occurring at night or during morning hours. Visible plumes from the proposed WEC HRSGs are not expected to occur greater than 10% of seasonal daylight clear hours. For the purposes of the HRSG, the plume frequencies are predicted to be less than 10% of seasonal daylight clear hours.

Given the 11.5-mile distance from the Turlock Airport and the fact that plumes would be expected for only part of the year, staff concludes that visible plumes would not have a significant impact on air traffic safety. Staff believes that the potential impact of visible plumes on road traffic safety would be even more localized than seasonal ground fog in the Turlock region, which requires that drivers exercise a reasonable degree of caution in the fog region and at times, reduce speed. Since traffic levels on the local roads surrounding the site are relatively low, staff concludes that transient visible plumes from the WEC cooling tower would not result in a significant impact to traffic safety.

CUMULATIVE IMPACTS

Based on the current and future traffic characteristics of the area, congestion associated with the operation of the project is nominal. With mitigation, regional and local roadways will have adequate capacity to accommodate project construction traffic.

According to City of Turlock information, specific planned or approved projects within one mile of the WEC project site includes: an interior remodel of the existing Sunnyside Farms facility located on Kilroy Road, the expansion of a water line to the existing Varco-Pruden facility and improvement to West Main Street between Tegner Road and State Highway 99 to four-lane arterial status. West Main Street is currently a two-lane major arterial. The improvements to West Main Street may occur within the next two to five years depending on the City's budget and financing for the project.

Construction schedules for these projects may overlap with the WEC construction schedule. The impacts associated with the construction phase of the WEC project are short-term and the operational phase impacts will be less than significant due to the increase in employees (21 new permanent employees) above current conditions, thus a significant impact is not expected under cumulative conditions.

FACILITY CLOSURE

The minimum design life of the WEC is expected to be 30 years. To ensure that the planned closure will be completed in a manner that complies with all LORS, at least twelve months prior to the proposed decommissioning; the applicant shall prepare a closure 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 closure for the WEC on traffic and transportation will be similar to those discussed for the construction of the project. 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 about the effects of project closure on traffic and transportation.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed Walnut Energy Center (please refer to **SOCIOECONOMICS - Figure 1** in this PSA). However, as indicated in **SOCIOECONOMICS - Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff considers these to be pockets or clusters. Staff also reviewed Census 2000 information that shows the low-income population is less than fifty percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for traffic and transportation.

Based on the traffic and transportation analysis, staff has not identified significant direct or cumulative impact resulting from the construction or operation of the project, and therefore there is no traffic and transportation environmental justice issue related to this project.

MITIGATION

The applicant has indicated their intention to comply with all LORS relating to:

- the transport of oversized loads (Condition of Certification **TRANS-1**);
- the transport of hazardous materials (Condition of Certification **TRANS-2**); and

- receipt and compliance with all necessary encroachment and transportation permits for any construction activity within the public right-of-way (Condition of Certification **TRANS-3**).

Also, the applicant has agreed to prepare a construction traffic control plan and construction management plan that addresses timing of heavy equipment and building material deliveries, signing, lighting, traffic control device placement, coordination of the times for construction worker arrival with school bus times, and establishing work hours outside of peak traffic periods.

Staff has recommended conditions of certification to ensure compliance with the above-identified LORS. Staff also recommends adoption of conditions of certification to require the applicant to implement the following traffic and transportation mitigation measures:

- enforce a policy that all project-related parking occurs in designated parking areas (Condition of Certification **TRANS-4**);
- prepare a Traffic Control Plan (Condition of Certification **TRANS- 5**) subject to review by the City of Turlock, County of Stanislaus and/or Caltrans, and the Chatom Union School District. The Traffic Control Plan should specify measures to mitigate impacts associated with construction activities occurring within any public right-of-way in accordance with local jurisdictional requirements; and
- repair any damage to adjacent roadway sections incurred during construction to the road's pre-project construction condition (Condition of Certification **TRANS-7**). Any repair work needed shall occur outside of the ambient street traffic peak periods.

CONCLUSIONS

Staff analyzed the estimated potential construction and operational traffic/transportation effects generated by the proposed project and concludes:

- The proposed project's traffic increase on surface streets in the project's vicinity only represents a minor percentage of traffic. Project traffic may cause a short-term increase in congestion at the intersection of South Washington Road and West Main Street.
- Surface streets in the vicinity of the proposed project currently operate at an acceptable LOS as per the City of Turlock, General Plan Transportation Element. The South Washington Road/West Main Street intersection is estimated to operate at an acceptable LOS. The proposed project has not been demonstrated to cause a decline in a surface street LOS or the intersection LOS to an unacceptable level.
- Review of State Highway 99 information and discussion with Caltrans staff demonstrates that the existing average daily vehicle trips on Highway 99 within the City of Turlock will not significantly increase as a result of the project.
- Identified impacts can be mitigated to a level of insignificance by implementing the mitigation measures recommended in the proposed conditions of certification.

CONDITIONS OF CERTIFICATION

TRANS-1 The applicant shall comply with Caltrans and other relevant jurisdictions limitations on vehicle sizes and weights. In addition, the applicant or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

Verification: In the Monthly Compliance Reports (MCRs) , the applicant shall submit copies of any permits received during that reporting period. In addition, the applicant shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation. [12/18/02]

TRANS-2 The applicant or its contractor shall comply with Caltrans and other relevant jurisdictions limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In the MCRs, the applicant shall submit copies of permits received during the reporting period. In addition, the applicant shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation. [12/18/02]

TRANS-3 The applicant shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

Verification: The applicant shall include in its Monthly Compliance Reports, copies of all permits/licenses acquired by the applicant and/or subcontractors concerning the transport of hazardous substances. [9/9/02]

TRANS-4 During construction of the power plant and all related facilities, the project shall develop a parking and staging plan for all phases of project construction to enforce a policy that all project-related parking occurs on-site or in designated off-site parking areas.

Verification: At least 60 days prior to start of site mobilization, the applicant shall submit the plan to the (City and/or County) for review and comment, and to the CPM for review and approval. [9/9/02]

TRANS-5 The applicant shall prepare a construction traffic control and implementation plan for the project and its associated facilities. The applicant shall consult with the affected local jurisdiction(s) and Caltrans (if applicable), and relevant school districts, in the preparation of the traffic control and implementation plan. The local jurisdiction, Caltrans (if applicable), and school districts shall have 30 calendar days to review the plan and provide written comments to the applicant. The applicant shall provide a copy of the local jurisdiction's, Caltrans, and school district written comments and a copy of the traffic control and implementation plan to the CPM.

Verification: The traffic control and implementation plan shall include and describe the following minimum requirements:

- Timing of heavy equipment and building materials deliveries;
- Redirecting construction traffic with a flagperson;

- Signing, lighting, and traffic control device placement if required;
- Construction work hours and arrival/departure times outside of peak traffic periods;
- Coordination to avoid traffic safety hazards to school buses and school children on or near the construction worker travel and truck routes;
- Haul routes;
- Procedures for safe access to the main entrance;
- Ensuring access for emergency vehicles to the project site;
- Temporary travel lane closure;
- Ensure access to adjacent residential and commercial property during the construction of all linears; and
- Options and incentives for construction workforce ridesharing.

The applicant shall submit the proposed traffic control and implementation plan to the affected local jurisdiction and Caltrans for review and comment. The applicant shall provide any comment letters to the CPM for review and approval.

At least 30 calendar days prior to site mobilization, the applicant shall provide a copy of the traffic control and implementation plan to the CPM for review and approval.

TRANS-6 The applicant shall provide to the CPM a copy of the private vehicular access easement (PVAE) executed with the affected property owner(s) securing the Walnut Energy Center's secondary vehicle access to the subject property. The applicant shall also provide to the CPM a copy of the maintenance and repair agreement for the PVAE executed with the affected property owner, allowing the applicant to maintain, service and repair the vehicle access easement area. The PVAE and the maintenance/repair agreement shall be executed prior to the start of construction of the project.

Verification: At least 30 calendar days prior to the start of construction, the applicant shall submit to the CPM a copy of the executed PVAE and maintenance/repair agreement.

TRANS-7 The applicant shall repair affected public rights-of-way (e.g., highway, road, bicycle path, pedestrian path, etc.) to original or near original condition that has been damaged due to construction activities conducted for the project and its associated facilities.

Prior to start of site mobilization, the applicant shall notify the affected local jurisdiction(s) and Caltrans (if applicable) about their schedule for project construction. The purpose of this notification is to request the local jurisdiction(s) and Caltrans to consider postponement of public right-of-way repair or improvement activities until after project construction has taken place and to coordinate construction related activities associated with the applicable identified local jurisdiction or Caltrans project(s) with the applicant.

Verification: Prior to the start of site mobilization, the applicant shall photograph, or videotape the following public right-of-way segment(s): Commons Road, South Washington Road, South Walnut Road, Ruble Road, Taylor Road, West Main

Street, West Harding Road, West Linwood Avenue and West Bradbury Road. The applicant shall provide the CPM, the affected local jurisdiction(s) and Caltrans (if applicable) with a copy of these images.

Within 60 calendar days after completion of construction, the applicant shall meet with the CPM, the affected local jurisdiction(s) and Caltrans (if applicable) to identify sections of public right-of-way to be repaired, to establish a schedule to complete the repairs and to receive approval for the action(s). Following completion of any public right-of-way repairs, the applicant shall provide to the CPM a letter signed by the affected local jurisdiction(s) and Caltrans stating their satisfaction with the repairs.

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FIGURES

TRAFFIC AND TRANSPORTATION - Figure 1
Walnut Energy Center Power Project – Circulation System

TRAFFIC AND TRANSPORTATION – Figure 2
Walnut Energy Center Power Project –Truck Route

TRAFFIC AND TRANSPORTATION - Figure 3
Walnut Energy Center Power Project - Linear Facilities Location Map

TRAFFIC AND TRANSPORTATION – Figure 4
Walnut Energy Center Power Project - Key Traffic Locations

TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelam, Ph.D.

INTRODUCTION

The electrical energy from the proposed Turlock Irrigation District (TID) Walnut Energy Center (WEC) would be delivered to the TID power grid through new double-circuit 115 kV and 69 kV overhead transmission lines. The delivery would be made indirectly through the nearby Walnut Substation, located less than one mile to the northwest. The applicant (TID) would design, build, and maintain the two proposed lines according to its current practices, which reflect compliance with existing health and safety laws, ordinances, regulations, and standards or LORS (TID 2002a, pages 2-6, 5-3 through 5-6, pages 5-11, and 5-14 through 5-16).

The purpose of this staff analysis is to assess the proposed line construction and operation plan for incorporation of the measures necessary for compliance with the related field and non-field impacts whose reduction remains the focus of the current LORS. If such compliance were established, staff would recommend approval with respect to the issues of concern in this analysis; if not, staff would recommend revisions as appropriate. Staff's analysis focuses on the following issues as related primarily to the physical presence of the lines, or secondarily, to the physical interactions of their electric and magnetic fields:

- aviation safety;
- interference with radio-frequency communication;
- audible noise;
- fire hazards;
- hazardous shocks;
- nuisance shocks; and
- electric and magnetic field (EMF) exposure.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Discussed below by subject area are design-related LORS applicable to the physical impacts of the overhead transmission lines as proposed for WEC. The potential for these impacts is assessed in terms of compliance with specific federal or state regulations or established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above. However, many local jurisdictions require such lines to be located underground in new housing developments because of the potential for visual impacts on the landscape. Such requirements are not related to the concern over health effects.

AVIATION SAFETY

Any potential hazard to area aircraft would relate to the potential for collision in the navigable air space. The applicable federal LORS, as discussed below, are intended to ensure the distance and visibility necessary to prevent 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 the aviation hazards of concern.
- 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 as produced by the physical interactions of line electric fields. Since electric fields are unable to penetrate most materials, including the soil, such interference and other electric field effects are not associated with underground lines. The level of any 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 are specified 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 itself 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 recommends specific conditions of certification (**TLSN-3**) to ensure compliance with this FCC requirement.

State

- California Public Utilities Commission (CPUC), General Order 52 (GO-52), governs the construction and operation of power and communications lines 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 into 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 through design, construction or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All modern overhead high-voltage lines are designed to assure compliance. As with radio-frequency noise, such audible 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, especially in wet weather. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from those of less than 345 kV as proposed for TID. 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 overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) 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 the proposed

overhead lines, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff recommends specific conditions of certification (**TLSN-2**) to ensure that such grounding is made along the proposed route.

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

- CPUC, General Order 95 (GO-95), "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 addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line whether overhead or underground. 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

- CPUC, GO-95, "Rules for Overhead Line Construction," 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., Sections 2700 through 2974, "High Voltage Electric Safety Orders," establish essential requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.

Industrial Standards

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from 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 describing

exposure to them together as EMF exposure. The available evidence as evaluated by CPUC, other regulatory agencies, and staff, 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. Staff, therefore, considers it appropriate in light of present uncertainty, to recommend reduction of such fields as feasible without affecting safety, efficiency, reliability and maintainability.

While there is considerable uncertainty about EMF health effects, 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 are about 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 each utility within its jurisdiction to establish EMF-reducing measures and incorporate such measures into the designs for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities, such as TID, which are 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.

In keeping with this CPUC policy, staff requires a showing that each proposed overhead line would be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability, efficiency, and maintainability. Therefore, it is up to each applicant to ensure that such measures are applied in ways that prevent significant impacts on line operation and safety. The extent of such applications would be reflected by the ground-level field strengths as measured during operation. When estimated or measured for lines of similar voltage and current-carrying capacity, such field strength values can be used by staff and other regulatory agencies to assess the effectiveness of the applied reduction measures. These 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 support structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required by the CPUC to be designed according to the EMF-reducing guidelines of the electric utility in the service area involved, its fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the proposed TID lines according to existing TID field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management. Staff recommends a specific condition of certification (**TLSN-1**) to ensure implementation of the design measures necessary.

Industrial Standards

There are no health-based federal regulations or industry codes 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 health 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, New Jersey, New York, Montana) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component whose effects can manifest themselves as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate soil, building and other 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 overhead transmission and other high-voltage power lines, staff considers it important, for perspective, to note that an individual in a home could be exposed to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S Department of Energy, 1995). The difference between these types of field exposures is that the higher-level, appliance-related exposures are short-term, while the exposure from power lines are lower-level, but long-term. 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 around high-voltage power lines.

SETTING

According to information from the applicant (TID 2002a, pages 1-2, 1-3, 2-2, 5-1 through 5-4, and 8.4-4 through 8.4-13), the proposed WEC would be located on

approximately 18 acres within a 69-acre land parcel in the City of Turlock. The area is a mixture of industrial, agricultural, and rural residential uses with the proposed lines to be located in an area of industrial and business park uses. The site was chosen in part because its proximity to the electrical transmission lines and the Walnut Substation to be used to transmit the generated power. Because of such proximity, the length of the project's 115 kV line would only be 1,950 feet as it is located along the northern boundary, within the right-of way of a proposed access road. The 69 kV line would be 670 feet as it runs within a route along the south property line of the project parcel and Ruble Road. Since the routes of both lines would pass through open farmland or areas zoned and designated for industrial uses (with the nearest residence located about 375 feet from the site), the residential magnetic field exposure at the root of the present health concern would be insignificant for this project and related facilities. The only project-related EMF exposures of potential significance are the short-term exposures to plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in transit across the project's lines. These types of exposures are short term and well understood as not significantly related to the present health concern. The same lack of nearby residences means that the previously noted electric field-related communication impacts would even be more unlikely from operations.

PROJECT DESCRIPTION

The proposed WEC lines will consist of the segments listed below:

- one double-circuit overhead 115 kV lines extending 1,950 feet from the project's 115 kV switchyard to the connection point on the 115 kV Walnut-Hilmar transmission line;
- one double-circuit 69 kV line extending 670 feet from the project's 69 kV switchyard to the connection point on the 69 kV Walnut-Industrial Line 2 transmission line; and
- the project's on-site 69 kV and 115 kV switchyards.

These interconnections schemes would constitute a looping of the interconnected lines into the new on-site project 69 kV and 115 kV lines. From the proposed connection points, one of the Walnut-Hilmar lines presently extends 750 feet to its termination point at the Walnut Substation to the northeast. The other one extends six miles to the south to its termination point at the Hilnar Substation. From the proposed connection point on the 69 kV Walnut-Industrial Line 2, one existing line proceeds approximately 4,500 feet northwards to its termination point at the Walnut Substation. The other line proceeds approximately 1.7 miles to the southeast to its termination point at the Industrial Substation.

Because of the project-related line connections, the existing Walnut-Hilmar 115 kV line would become a line with two segments to be designated as WEC-Hilmar 115 kV and WEC-Walnut 115 kV line. The Walnut-Industrial 69 kV Line 2 would become two segments, one designated as the WEC-Industrial 69 kV line, and the other, WEC-Walnut 69 kV line. The proposed WEC lines would be carried on steel poles or wooden poles as used for similar TID lines. Since these lines would extend from existing rights-of-way directly into the adjacent project site, no new rights-of-way would need to be acquired. These basic configurations of these TID designs were provided by the applicant as relevant to safety, efficiency, reliability, and field cancellation effectiveness.

Since the proposed WEC lines are to be designed and operated according to standard TID practices, their design-driven field strengths (and, therefore, potential contribution to existing area fields levels) should be at the same level as from TID lines of the same voltage and current-carrying capacity. Staff recommends a specific condition of certification (**TLSN-4**) to provide the data necessary for the required compliance assessment. The need for further mitigation would be established from such an assessment.

IMPACTS

GO-95, and Title 8, CCR Section 2700 et seq., as noted in the LORS section, ensures the minimum regulatory requirements necessary to prevent the direct or indirect contact previously discussed in connection with hazardous shocks or aviation hazards. Of secondary concern are the noted field impacts manifesting themselves 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 applied field-reducing measures can affect line operations and safety, the extent of their implementation and resulting field strengths will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. They will, therefore, vary from one service area to the other according to prevailing conditions. It would be up to each project proponent to ensure that such measures are applied to the extent appropriate for the geographic area involved.

PROJECT SPECIFIC IMPACTS

Aviation Safety

As noted by the applicant (TID 2002a, pages 5-13 and 5-14), three airfields are located within six miles of the proposed project and related lines. Turlock Air Park, for example, is located about 2.9 miles to the south and east of the project and related facilities. The other two airfields are small private landing strips located approximately four miles and five miles south and southeast of the site. Given these relatively long distances and the orientation of their respective runways, staff considers the proposed lines as unlikely to pose a significant obstruction-related aviation hazard to utilizing aircraft as defined using current FAA criteria. Moreover, the maximum height of the proposed lines would (at 110 feet) be too low to cause a collision hazard as defined by the FAA. Therefore, no FAA “Notice of Construction or Alteration” would be required. However, the owners of new transmission lines usually contact the FAA about such lines as a standard industry practice. The applicant will ensure that FAA is informed about the proposed lines, as is standard industry practice. As also noted by the applicant, these lines are proposed for an area with many similar or taller lines that have not posed a significant hazard to area aviation.

Interference with Radio-Frequency Communication

The previously noted corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware, and other discontinuities around the conductor surface.

The proposed lines will be built and maintained according to standard TID practices minimizing such surface irregularities and discontinuities (TID 2002a, pages 5-12). Moreover, the potential for such corona-related interference is usually of concern for lines of 345 kV and above, and not the proposed 115 kV and 69 kV lines, even in rainy weather when the presence of raindrops increases the strengths of the offending surface electric fields. The proposed low-corona design would be the same as used for the exiting TID 115 kV and 69 kV lines of similar voltage rating. Since these existing lines do not currently produce the corona effects of specific concern, staff does not expect any corona-related radio-frequency interference any where around the proposed route. In the unlikely event of interference-related complaints, the applicant would be responsible for the necessary mitigation as required by the FCC. Staff recommends a specific condition of certification (**TLSN-3**) in this regard.

Audible Noise

As happens with radio noise, the low-corona design to be used for the proposed WEC lines would serve to minimize the potential for corona-related audible noise. This means, as noted by the applicant (TID 2002a, pages 5-7 and 5-8), that the proposed line operation would be unlikely to add significantly to current background noise levels in the project area. For an assessment of the noise from all phases of the proposed project and related facilities, please refer to staff's analysis in the **Noise and Vibration** section of this staff assessment.

Fire Hazards

Standard fire prevention and suppression measures for all PG&E lines would be implemented for the proposed lines (TID 2002a page 5-14). The applicant's intention to ensure compliance with the clearance-related aspects of GO-95 would be an important part of this compliance approach. Moreover, the routes for the proposed interconnection lines are zoned for agricultural and industrial uses without the trees that could pose a fire hazard from line contact.

Hazardous Shocks

The applicant's noted intention to implement the GO-95- related measures against direct contact with the energized line (TID 2002a, page 5-13) would serve to minimize the risk of hazardous shocks. Staff recommends a specific condition of certification (**TLSN-1)** to ensure implementation of the necessary mitigation measures.

Nuisance Shocks

The potential for nuisance shocks around the proposed lines would be minimized through standard industry grounding practices (TID 2002a, page 5-12 and 5-13). Staff recommends Condition for Certification **TLSN-2** to ensure such grounding.

Electric and magnetic field exposure

The applicant (TID 2002a, pages 4-4 and 4-5) estimated the maximum field strengths possible along the routes of the area lines to be affected by the added power from the proposed WEC (TID 2002a, pages 5-10 and 5-11). Merely connecting the new lines to the existing lines of the same voltage would not change the existing voltages within the interconnected grid. Since the electric fields are produced by line voltage, ground-level intensities may change at specific locations from the interactive effects of fields from the conductors of nearby or interconnected lines. Field strength estimates were calculated

to reflect the maximum field intensities along the routes of the proposed lines, the routes of the existing lines, and the respective interconnection points with the existing lines. Staff has verified the accuracy of the applicant's calculations with respect to design factors bearing on field strengths and exposure assessment. The maximum electric field calculations were intended to show that project related voltage would not change the existing electric fields without significant changes in the applied voltage.

The maximum electric field along all the existing lines were presented as ranging from 0.17 kV/m to 0.39 kV/m. The maximum intensity electric field strength (as associated with the existing 115 kV lines) was presented as 0.30 kV/m, showing what staff considers and insignificant change in area electric fields as typical of the TID lines of the proposed designs

The applicant's maximum magnetic field estimates within all area the rights-of-way without the energy from WEC, was presented as 33.51 milligauss (mG) at the centerline, diminishing to 4.23 mG 100 feet from the centerline. The maximum field strength with the added current from the proposed WEC was presented as 34.60 mG, diminishing to 3.95 mG 100 feet away. Staff considers the reflected project-related increase as insignificant with respect to the human exposures at issue for such lines. These magnetic fields are much lower than the 150 to 250 mG established (depending on voltage level) for the edges of the rights-of-way by the few states with regulatory limits on these line magnetic fields.

The field reduction measures to be incorporated into the proposed line design include the following:

1. Increasing the distance between the conductors and the ground;
2. Reducing the spacing between the conductors;
3. Minimizing the current in the line; and
4. Arranging current flow to maximize the cancellation effects from interacting fields from nearby conductors.

Since these field-reducing measures have been incorporated into the proposed line design, staff considers further mitigation to be unnecessary at this point, but recommends a specific condition of certification (**TLSN-4**) to validate the reduction efficiency assumed by the applicant. The need for further mitigation would be assessed from this efficiency assessment.

CUMULATIVE IMPACTS

Since the proposed WEC-related transmission lines would be designed according to applicable field-reducing TID guidelines (as currently required by the CPUC for effective field management), staff expects the resulting fields to be similar in intensity to fields from TID lines of the similar voltage and current-carrying capacity. Any contribution to cumulative area exposures would be at similar levels. It is this similarity in intensity that constitutes compliance with current CPUC requirements on EMF management. The presented fields were calculated to reflect the additive or cancellation effects of fields from nearby conductors, thus reflecting any potential cumulative exposures. The actual

field strengths and contribution levels for the proposed line design would be assessed from the results of the field strength measurements specified in Conditions of Certification **TLSN-4**.

ENVIRONMENTAL JUSTICE

Staff has reviewed the Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed Walnut Energy Center (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff considers these to be pockets or clusters. Staff also reviewed Census 2000 information that shows the low-income population is less than 50 percent within the same radius. Because staff have determined there to be pockets or clusters of minority population within the six-mile radius, staff conducted a focused environmental justice analysis with respect to transmission line safety and nuisance.

Based on staff's transmission line safety and nuisance analysis, which included consideration of information provided by participants at workshops, staff has not identified any unmitigated, significant direct or cumulative impacts resulting from construction or operation of the project, meaning that there would be no transmission line safety and nuisance-related environmental justice issues for this project.

COMPLIANCE WITH LORS

As previously noted, current CPUC policy on safe EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility, which for WEC is TID. Since the proposed 115 kV and 69 kV lines are to be designed, operated, and maintained according to current TID guidelines on line safety and field strength management, staff considers the presented design and operational plan to be in compliance with the health and safety LORS of concern in this analysis. The actual contribution to the area's field exposure levels would be assessed from results of the field strength measurements required in **TLSN-4**.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for overhead and underground lines, the public health significance of any WEC-related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed line design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent CPUC considers appropriate in light of the available health effects information. The long-term, mostly residential magnetic exposure at the root of the present health concern would be insignificant for the proposed interconnection lines given the general

absence of residences along the proposed route. On-site worker or public exposure would be short term and at levels expected for TID lines of similar designs and current-carrying capacity. Such exposure is well understood and has not been established as posing a significant human health hazard.

The potential for nuisance shocks would be minimized through grounding and other field-reducing measures to be implemented in keeping with current TID guidelines (reflecting standard industry practices). Since there are no major airports or aviation centers in the immediate project area, staff does not expect the proposed lines to pose a significant aviation hazard. The use of low-corona line design, together with appropriate corona-minimizing construction practices, minimizes the potential for corona noise and its related interference with radio-frequency communication in the area around the proposed route.

RECOMMENDATIONS

Since the WEC interconnecting 69 kV and 115 kV lines would be designed to minimize the safety and nuisance impacts of specific concern to staff and routed through an area with few residences, staff does not recommend further mitigation and recommends approval of the proposed design and operational plan. If such approval is granted, staff recommends that the Energy Commission adopt the conditions of certification specified below to ensure implementation of the measures necessary to achieve the field reduction and line safety assumed by the applicant.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall provide specific evidence that the proposed interconnection transmission lines will be designed and constructed by PG&E according to the requirements of CPUC's GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and TID's EMF reduction guidelines arising from CPUC Decision 93-11-013.

Verification: 30 days before starting construction of WEC's transmission lines or related structures and facilities, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter from PG&E affirming that the overhead section will be constructed according to the requirements of GO-95, GO 52, Title 8, Section 2700 et seq. of the California Code of Regulations, and TID's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

TLSN-2 The project owner shall provide specific evidence that all metallic objects along the route of the overhead section will be grounded according to TID practices reflecting standard industry practices.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming potential compliance with the specified grounding requirements, as is standard TID practice.

TLSN-3 The project owner shall provide specific evidence that reasonable steps will be taken to resolve any complaints of interference with radio or television signals from operation of the proposed lines.

Verification: The project owner shall provide a letter specifying its intention to prepare a summary of line-related complaints along with related mitigation measures for the first five years of operation. The applicant shall provide such summary reports to the CPM in an annual report.

TLSN-4 The project owner shall provide the results of the electric and magnetic field measurements for the existing and proposed lines (according to IEEE measurement protocols) before and after they are energized. Measurements shall be made at representative points (on-site and along the line route) as necessary to identify the maximum field exposures possible during WEC operations. The locations for such measurements are those identified by the applicant as Points A, B, C, D, and E and for which field strength estimates were provided.

Verification: The project owner shall submit the field measurement results to the CPM within 60 days of completion.

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VISUAL RESOURCES

Eric Knight

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether construction and operation of the Walnut Energy Center (WEC) would cause visual impacts and whether the project would be in compliance with applicable laws, ordinances, regulations, and standards (LORS). The determination of the potential for visual impacts resulting from the proposed project is required by the California Environmental Quality Act (CEQA).

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- description of analysis methodology;
- description of applicable laws, ordinances, regulations, and standards (LORS);
- description of the project aspects that may have the potential for significant visual impacts;
- assessment of the visual setting of the proposed power plant site and linear facility routes;
- evaluation of the visual impacts of the proposed project on the existing setting;
- evaluation of compliance of the project with applicable LORS;
- identification of measures needed to mitigate any potential significant adverse impacts of the proposed project and/or to achieve compliance with applicable LORS;
- conclusions and recommendations; and
- proposed conditions of certification.

ANALYSIS METHODOLOGY

Visual resources analysis has an inherently subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

Significance Criteria

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

State

The CEQA Guidelines define 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 CEQA Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant.
Would the project have a substantial adverse effect on a scenic vista?
Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Local

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such LORS can constitute significant visual impacts. See the section below titled Laws, Ordinances, Regulations, and Standards.

Professional Standards

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (Smardon 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

- 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?

Impact Duration

The visual analysis typically distinguishes three different impact durations. **Temporary impacts** typically last no longer than two years. **Short-term impacts** generally last no longer than five years. **Long-term impacts** are impacts with a duration greater than five years.

View Areas and Key Observation Points

The proposed project would be visible from several areas surrounding the project site. Energy Commission staff evaluated the visual impact of the project from each of these

areas. Staff used Key Observation Points[1], or KOPs, as representative locations from which to conduct detailed analyses of the proposed project and to obtain existing condition photographs and prepare visual simulations. KOPs are selected to be representative of the most critical locations from which the project would be seen. However, KOPs are not the only locations that staff considered in each view area. Prior to the filing of the Application for Certification (AFC), staff visited the project area with consultants to Turlock Irrigation District (TID or applicant) for the purpose of selecting the KOPs. Staff believes that the KOPs presented in the AFC are appropriate for this analysis.

Evaluation Process

For each view area, staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. The results of staff's analysis are summarized in **Visual Resources Appendix VR-1**. Existing conditions photographs and photosimulations from each KOP are presented with all other figures in **Visual Resources Appendix VR-4**.

Elements of the Visual Setting

To assess the existing visual setting, staff considered the following elements.

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. This analysis used an approach that considers visual quality as ranging from outstanding to low (see **Visual Resources Table 1**). 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).

Viewer Concern

Viewer concern is a measurement of the level of viewer interest 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 concern. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are generally considered to have high viewer concern. However, existing landscape character may temper viewer concern on some state and locally designated scenic highways and corridors. Similarly, travelers on other highways and roads, including those in agricultural areas, may have moderate viewer concern depending on viewer expectations as conditioned by regional and local landscape features. Commercial uses, including business parks, typically have low-to-moderate viewer concern, though some commercial developments have specific requirements related to visual quality, with respect to landscaping, building height limitations, building

[1] The use of KOPs or similar view locations is common in visual resource analysis. The U.S. Bureau of Land Management (USDI BLM 1986a, 1986b, 1984) and the U.S. Forest Service (USDA Forest Service 1995) use such an approach.

design, and prohibition of above-ground utility lines, which indicate a higher level of viewer concern. Industrial uses typically have the lowest viewer concern because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Visual Resources Table 1
Landscape Visual Quality Ratings

Visual Quality Rating	Description
Outstanding	A rating reserved for landscapes with exceptionally high visual quality. These landscapes will be significant regionally and/or nationally. They usually contain exceptional natural or cultural features that contribute to this rating. They will be what we think of as “picture post card” landscapes. People will be attracted to these landscapes to be able to view them.
High	Landscapes that have high-quality scenic value. This may be due to cultural or natural features contained in the landscape or to the arrangement of spaces contained in the landscape that causes the landscape to be visually interesting or a particularly comfortable place for people. These are often landscapes that have high potential for recreational activities or in which the visual experience is important.
Moderately High	Landscapes that have above average scenic value but are not of high scenic value. The scenic value of these landscapes may be due to man-made or natural features contained in the landscape, to the arrangement of spaces in the landscape, or to the two-dimensional attributes of the landscape.
Moderate	Landscapes that have average scenic value. They usually lack significant man-made or natural features. Their scenic value is primarily a result of the arrangement of spaces contained in the landscape and the two-dimensional visual attributes of the landscape.
Moderately Low	Landscapes that have below average scenic value but not low scenic value. They may contain visually discordant man-made alterations, but the landscape is not dominated by these features. They often lack spaces that people will perceive as inviting and provide little interest in terms of two-dimensional visual attributes of the landscape.
Low	Landscapes with low scenic value. The landscape is often dominated by visually discordant man-made alterations; or they are landscapes that do not include places that people will find inviting and lack interest in terms of two-dimensional visual attributes.

TID 2002a; AFC Table 8.11-1
Rating scale based on Buhyoff et al., 1994

Viewer Exposure

The visibility of a landscape feature, the viewing distance to the landscape feature, the number of viewers, and the duration of the view all affect the exposure of viewers to a given landscape feature. Visibility is highly dependent on screening and angle of view. The smaller the degree of screening and/or the closer the feature is to the center of the view area, the greater its visibility. Increasing distance reduces visibility. Viewer exposure can range from low values for all factors, such as a partially obscured and brief background view for a few motorists, to high values for all factors, such as an unobstructed foreground view from a large number of residences.

Visual Sensitivity

The overall level of sensitivity of a view area to impacts due to visual change is a function of visual quality, viewer concern, and viewer exposure and can range from low to high.

Types of Visual Change

To assess the visual changes that the project would cause, staff considered the following factors.

Contrast

Visual contrast describes the degree to which a project's visual characteristics or elements (consisting of form, line, color, and texture) differ from the same visual elements established in the existing landscape. The degree of contrast can range from low to high. The presence of forms, lines, colors, and textures in the landscape similar to those of a proposed project indicates a landscape more capable of accepting those project characteristics than a landscape where those elements are absent. This ability to accept alteration is often referred to as visual absorption capability and typically is inversely proportional to visual contrast.

Dominance

Another measure of visual change is project dominance. Dominance is a measure of a feature's apparent size relative to other visible landscape features and the total field of view (scale dominance). A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature (spatial dominance). The level of dominance can range from subordinate to dominant.

View Blockage/Disruption

View blockage describes the extent to which any previously visible landscape features are blocked from view by the project. View disruption considers the interruption (i.e., "breaking up" rather than total blockage) of a view of large landforms such as mountain ranges, or where a project would physically replace previously visible landscape features. View blockage or disruption of higher quality landscape features by lower quality project features causes adverse visual impacts. The degree of view blockage can range from none to high.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

The proposed WEC site and linear facility routes are not located on federally administered public lands and therefore not subject to federal regulations pertaining to visual resources.

STATE

State highways in the region surrounding the WEC site include Interstate (I) 5 and State Routes (SR) 33, 99, and 132. Except for I-5, none of these roadways are officially designated or eligible State Scenic Highways. I-5, from SR 205 to SR 152 is an Officially Designated State Scenic Highway (Caltrans 2003). However, the project site is approximately 15 miles east of I-5. Because the project would not be located within the viewshed of a State Scenic Highway, no state regulations pertaining to scenic resources are applicable to the project.

LOCAL

The WEC site is located within the City of Turlock. Therefore, the project would be subject to local LORS pertaining to the protection and maintenance of visual resources. Policies, regulations, and design guidelines applicable to the proposed project are found in the Turlock General Plan and Turlock Zoning Ordinance. Portions of the project's natural gas and water pipelines and electric transmission lines would be located within unincorporated Stanislaus County. The project's consistency with local policies and regulations is discussed in the section below titled Conformance with Laws, Ordinances, Regulations, and Standards.

PROJECT DESCRIPTION

The following section describes the aspects of the proposed project that may have the potential to cause adverse impacts to visual resources.

POWER PLANT

The proposed power plant facilities would occupy 18 acres of a 69-acre parcel owned by TID. **Visual Resources Table 2** lists the dimensions of key project components. The most visually prominent structures of the WEC would be the two heat recovery steam generator (HRSG) units, the two HRSG stacks, the two brine concentrators, and the cooling tower. The HRSG units would be 65 feet tall and 100 feet long. The highest relief valves and vent silencers at the top of the HRSG units would reach a height of 105 feet. The HRSG stacks would be 132 feet tall and 17 feet in diameter. The brine concentrators would be 112 feet tall and 10 feet in diameter (17 feet at their base). The cooling tower would be 56 feet tall and 271 feet in length.

LINEAR FACILITIES

The project would connect to the TID electrical transmission system via two new transmission lines. The double-circuit 115 kV transmission line would exit the WEC switchyard on the west side of the site and would extend westerly for approximately 1,950 feet where it would interconnect with the existing Walnut/Hilmar 115 kV line that runs along the eastern side of South Washington Road. The proposed 115 kV line would be supported by eight new poles, including one new pole on the west side of South Washington Road to tie the line into the TID Walnut Substation (TID 2002a; p. 8.11-15). The double-circuit 69 kV line would proceed south from the WEC switchyard for approximately 670 feet to intersect with the existing Walnut/Industrial 69 kV Line 2 transmission line. The 69 kV line would require two new poles (TID 2002a; p. 8.11-16). Wood poles would be used for the tangent poles and weathering steel (brown in color) would be used for heavy angles and at the take-off structures where the new lines would tie into the existing lines (TID 2002a; p. 5-3). The 115 kV transmission poles would be approximately 66 to 76 feet tall, and the 69 kV transmission poles would be approximately 56 to 66 feet tall (TID 2002b).

Visual Resources Table 2
Dimensions of Key Project Components

Structure	Height (feet)	Length (feet)	Width (feet)	Diameter (feet)
HRSGs				
HRSG Casings	65	100	24	
To platform	73		45	
To top of highest drums	80			
To top of highest relief valves and vent silencers	105			
HRSG stacks	132			17
Combustion Turbine Generators (CTGs)				
CTGs	20	143	39	
CTG Inlet Air Filters	47	63	37	
Steam Turbine Generator (STG)				
STG	56	72	24	
STG Pedestal	36	83	43	
Cooling Tower (5 cells)		271	55	37
To top of deck	42			
To top of fan shrouds	56			
Brine Concentrators	112			10
Crystallizers	42			8
Tanks				
Recycled Water Tank	35			50
Blowdown Storage Tank	35			50
Demineralized Water Storage Tank	43			34
Service/Fire Water Storage Tank	35			42
Switchyard		350	160	
Conductor Take-off Structures	50			
Gas Compressor Area		80	50	
Gas Yard		120	55	
Gas Metering Station		55	55	

Source: TID 2002a; AFC Table 8.11-2

The project would include an approximately 3.6 mile long pipeline to convey natural gas to the power plant. The pipeline would begin at the intersection of Bradbury Road and Commons Road, where it would tie into a PG&E gas transmission line (Line 215). From the interconnection point, the gas pipeline would follow Commons Road north, where just south of the Union Pacific Railroad tracks, the pipeline would turn east toward the WEC site, running parallel to the railroad tracks. An aboveground gas metering station would be constructed at the WEC site to measure and record gas volumes. The gas metering station would require an area measuring approximately 55 feet by 55 feet. Isolation block valves would be installed at both ends of the pipeline. Warning markers to identify the location of the pipeline would be installed at all road crossings.

The WEC would use recycled water from the City of Turlock wastewater treatment plant (WWTP) for cooling purposes. The 1.6-mile long pipeline that would convey the recycled water to the WEC would begin at the WWTP, then head north on Kilroy Road, turn west at an existing 69 kV TID transmission line corridor, head north again on Tegner Road, and then west on Ruble Road to the WEC site. The project would also include an approximately 0.85-mile long potable water pipeline that would interconnect with the City's existing potable water main line in Tegner Road. The potable water line would be constructed underneath Ruble Road.

CONSTRUCTION LAYDOWN AND WORKER PARKING AREA

Construction of the project is expected to last for 20 to 24 months (TID 2002a). Construction laydown and parking areas for the project would be located immediately west of the WEC site and would occupy approximately 27 acres of the 69-acre TID-owned parcel.

Construction of the gas pipeline is expected to take five months, and construction of the recycled and potable water supply pipelines is expected to take three to five months (TID 2002a; p. 6-2 and 7-2). Construction of the pipelines is anticipated to begin toward the end of the first year following the start of project construction. Construction of the pipelines would disturb an area 50- to 70-feet wide along the pipeline rights-of-way (ROW). Most major pieces of equipment used to construct the pipelines would remain along the pipeline ROWs during construction of the lines. The laydown area adjacent to the WEC site would be used to store pipe and other pipeline construction materials. Additional storage areas would be located in existing paved or graveled areas along the pipeline ROWs.

SETTING

PROJECT AREA SETTING

The WEC site is located in the southern portion of Stanislaus County, within the city limits of Turlock. The site is located at the western edge of the City of Turlock, approximately 2.7 miles west of SR 99, within an area that includes industrial, agricultural, and rural residential land uses. The project area primarily consists of dairy product processing facilities, grain mills and silos, cattle grazing areas, and large fields cultivated for dairy feed crops. For example, immediately to the north of the WEC site are the large Foster Farms' Foster Commodities West Main grain silos. The Foster Farms silos range in height from 80 to 170 feet tall (TID 2002a; p. 8.11-1). Other agricultural related industrial facilities are located to the east of the WEC site, and include Del Mesa Farms, Simon Newman Feed Mill, and California Dairies. These facilities consist of large-scale structures with industrial character. **Visual Resources Figure 2** provides several photographs of the existing industrial facilities in the project vicinity. **Visual Resources Figure 1** shows the location where the local character photographs provided in Figure 2 were taken, and shows the direction the camera was facing when the photograph was shot. During a site visit in early March, small water vapor plumes were observed emanating from the Foster Farms and Simon Newman facilities, and a larger plume was seen emanating from the California Dairies facility on Tegner Road south of West Main Street. Residences in the immediate project area

include residences on West Main Street and South Washington, Ruble and Tegner Roads. Infrastructure in the vicinity includes the Union Pacific Railroad tracks and the Foster Farms railroad loop tracks north of the WEC site, and two 115 kV transmission lines running along both sides of South Washington Road and two 69 kV lines crossing the agricultural fields south of the project site. The TID Walnut Substation and peaking power plant are located on South Washington Road approximately 1,500 feet west of the WEC site.

PROJECT SITE

The proposed WEC would occupy approximately 18 acres of a 69-acre parcel owned by TID. The WEC site is bounded on the north by railroad tracks and on the west, south, and east by agricultural properties. The 69-acre parcel is bounded on the north by railroad tracks, on the east and south by agricultural fields, and on the west by South Washington Road. Currently the entire 69-acre parcel is used for cultivating field corn in the summer and oats in the winter (TID 2002a). The only structures on the parcel are the wood power poles of the Walnut/Industrial 69 kV transmission line that would be removed and replaced by the proposed 115 kV interconnection line.

VIEWING AREAS AND KEY OBSERVATION POINTS

Visual Resources Figure 3 generally identifies the areas from which the project would be visible, also called the project viewshed. Staff evaluated the visual setting and proposed project in detail from several viewing areas represented by five key viewpoints:

- KOP 1 – Ruble Road;
- KOP 2 – West Main Street and Washington Road;
- KOP 3 – 425 Commons Road;
- KOP 4 – 807 South Washington Road; and
- KOP 5 – 115 kV Transmission Line Crossing of South Washington Road.

The location and view direction of each of these KOPs is shown on **Visual Resources Figure 4**. At each KOP a visual analysis was conducted, the results of which are summarized in **Appendix VR-1**. Existing condition photographs are presented in **Appendix VR-4**. A discussion of the visual setting for each KOP is presented in the following paragraphs.

KOP 1 – Ruble Road

KOP 1 is located in front of a residence on Ruble Road, approximately 1,500 feet west of the intersection of Ruble and South Tegner Roads. The viewpoint is located approximately 0.2 mile southeast of the WEC site. This KOP was selected to represent the view of four residences located along this portion of Ruble Road. There are a total of about nine residences along Ruble Road. **Visual Resources Figure 5A** shows the existing view from KOP 1 to the northwest toward the WEC site. The view toward the project site from the westernmost residence on Ruble Road nearest the site is shown in **Visual Resources Figure 2** and AFC Figure 8.11-5. From this viewpoint, the project site is unobstructed when not being used to grow corn. The site is planted in corn from June to September (TID, 2002a; p. 8.11-3).

Visual Quality

The most prominent features in the view shown in Visual Resources Figure 5A are the Foster Farms silos, agricultural fields, and a ranch house and adjacent farming-related building. Other prominent landscape features visible to residents in the area of KOP 1, but not shown in Figure 5A, are agricultural related industrial facilities, including Del Mesa Farms, Simon Newman Feed Mill, and California Dairies to the north of KOP 1. Because the rural agricultural landscape visible from KOP 1 contains prominent industrial facilities with low visual quality, visual quality of the view is considered low to moderate overall.

Viewer Concern

The residential viewers represented by KOP 1 anticipate a rural agricultural landscape with prominent agricultural-related industrial facilities. The view from KOP 1 is lacking in notable scenic qualities. Many of the residential properties have been landscaped with trees that may, in part, have been planted to obscure views of the industrial facilities to the north of Ruble Road. Viewer concern for residences on Ruble Road is considered moderate to high.

Viewer Exposure

The photograph used in Figure 5A was taken from the road so the view toward the site appears less obstructed than it does from the residences themselves, which include trees and other vegetation in their front yards. The photograph is representative of the view residents have as they use their front yards or walk out to their mailbox to collect their mail. Only a small part of the site is visible from KOP 1 (between the farm structure and the Foster Farms silos), so visibility of the site is very low. However, the upper portions of the cooling tower, HRSG stacks, and brine concentrators would be visible from KOP 1, protruding from behind the ranch house and adjacent farm building. Considering the amount of screening provided by existing structures and the foreground distance from KOP 1, visibility is rated moderate. The KOP was selected to represent the view of four residences. It is also somewhat representative of two other residences located farther west on Ruble Road that also have front yard landscaping and partially obstructed views toward the site. Overall the view area includes a low to moderate number of viewers. Because the viewers are residents, view duration is considered long. Overall viewer exposure at the area of KOP 1 is moderate. The westernmost residence on Ruble Road is the only residence on this road that has an unobstructed view of the WEC site. Although visibility from this viewpoint is high, a very low number of potential viewers, such as one residence, can outweigh other exposure factors. Thus, like KOP 1, overall viewer exposure from this residence is considered moderate.

Overall Visual Sensitivity

For KOP 1, the low to moderate visual quality, moderate to high viewer concern, and moderate exposure, result in moderate overall visual sensitivity.

KOP 2 – West Main Street and Washington Road

KOP 2 is located at the intersection of West Main Street and Washington Road, approximately 0.4-mile northwest of the WEC site. The viewpoint was selected to represent the view of the site available to eastbound motorists on West Main Street and

to the two residences located on the southwest and northwest corners of the intersection. **Visual Resources Figure 6A** shows the existing view from KOP 2 to the southeast toward the WEC site.

Visual Quality

The most prominent features in the view shown in Figure 6A are the traffic signal pole and agricultural field that occupy the immediate foreground, and the Foster Farms and Del Mesa Farms facilities. Other features visible to viewers at this location looking toward the WEC site are the utility and electrical transmission lines that run along West Main Street and South Washington Road and railroad cars parked on the Foster Farms railroad loop tracks waiting to be unloaded. Rail deliveries to the Foster Farms silos are made one to two times per week, and it may take up to 24 hours to unload the train cars (TID 2002a; p. 8.11-2). Visual quality of the view toward the site is low to moderate.

Viewer Concern

West Main Street is a major route for motorists travelling to/from both SR 99 and I-5. Motorists on West Main Street and residents at KOP 2 anticipate a rural agricultural landscape with prominent agricultural-related industrial facilities. In addition to Del Mesa and Foster Farms to the east and southeast, the residence at 4813 West Main Street (at the northwest corner of the West Main Street and Washington Road) has a direct view of the Walnut Substation and peaking plant located about 0.2-mile to the south. The Associated Feed and Supply facility, which includes several tall grain silos, is located about 0.2-mile to the west of this residence and is visible from the front yard. The residential properties in the area of KOP 2 have been landscaped with trees that may, in part, have been planted to filter views of the surrounding industrial facilities. The City has designated West Main Street as a Gateway Route. This classification, which requires design review of development projects within view of the street, is an indication of the City's interest about the aesthetics of projects in this area. The view from KOP 2 is lacking in notable scenic qualities. Viewer concern at KOP 2 is considered moderate for motorists and moderate to high for residents.

Viewer Exposure

The average daily traffic (ADT) volume on West Main Street is 7,425 vehicles per day (TID 2002a; p. 8.11-7), which indicates a moderate to high number of potential viewers. There are two residences at the corner of West Main Street and Washington Road. There is another residence in the vicinity, just north of West Main Street on Washington Road. Thus, the number of residential viewers is low. Because of extensive front yard landscaping, views of the site from the residences themselves are partially obstructed. However, unobstructed views of the site from some points on the properties (e.g., at the mailbox) are possible. Views of the WEC site are unobstructed from the road, so visibility from KOP 2 is considered high. Motorists can focus on the site as they stop at the intersection and as they proceed east on West Main Street. The WEC site is within eastbound motorists' primary view direction for approximately 1,500 feet east of the West Main Street/Washington Road intersection. The posted speed limit on West Main Street is 45 miles per hour (MPH). At this travel speed, motorists could potentially focus on the site for approximately 22 seconds, indicating a low to moderate view duration. Duration of view of residences is extended. Overall viewer exposure is moderate to high for motorists and moderate for residences.

Overall Visual Sensitivity

For motorists at KOP 2, the low to moderate visual quality and moderate viewer concern and moderate to high exposure, result in moderate overall visual sensitivity. For residents at KOP 2, the low to moderate visual quality, moderate exposure, and moderate to high viewer concern, results in moderate overall visual sensitivity.

KOP 3 – 425 Commons Road

KOP 3 is located on Commons Road north of the Union Pacific Railroad tracks, opposite a residence at 425 Commons Road. This residence is located approximately 0.8-mile northwest of the WEC site. The viewpoint was selected to represent the view of the project site available to several residences along Commons Road. **Visual Resources Figure 7A** shows the existing view of two residences at KOP 3, looking to the southeast toward the WEC site. There is another residence to the north of the viewpoint that has a view similar to that shown in Figure 7A.

Visual Quality

The most prominent features in the view shown in Visual Resources Figure 7A are a tilled agricultural field (which was covered with vegetation when staff visited the project area in March), an orchard, and electrical transmission towers. The existing transmission line crosses Commons Road, and one tower is located on the west edge of the road. Other visible features of the landscape are the Foster Farms grain silos and the Walnut Substation and peaking plant (on the left-hand side of the photograph). Visual quality of the view from KOP 3 is considered low to moderate.

Viewer Concern

The residential viewers represented by KOP 3 anticipate a rural agricultural landscape with prominent agricultural-related industrial facilities and energy infrastructure. The view from KOP 3 is lacking in notable scenic qualities. Viewer concern for residences at KOP 3 is considered moderate to high.

Viewer Exposure

The viewpoint is almost one mile from the WEC site. Given the distance, and the fact that two transmission towers partially obstruct views of the site, visibility is rated moderate. There are three residences in the area of KOP 3 that have a view of the site similar to that shown in Visual Resources Figure 7A, so the number of viewers is low. View duration is extended. Overall viewer exposure is low to moderate.

Overall Visual Sensitivity

For KOP 3, the low to moderate visual quality, moderate to high viewer concern, and low to moderate exposure, result in moderate overall visual sensitivity.

KOP 4 – 807 South Washington Road

KOP 4 is located at 807 South Washington Road, north of Clayton Road, and was selected to represent the view of the WEC site available to several residences along South Washington Road. The viewpoint is located approximately 0.4-mile southwest of the project site. There are four residences (including the one shown across the street

from the viewpoint) in the area of KOP 4 that have an existing view of the WEC site similar to the one depicted in **Visual Resources Figure 8A**.

Visual Quality

The most prominent landscape features in the view are an agricultural field and the agricultural-related industrial facilities in the background. A 69 kV power line is visible in the center of the photograph. Not shown in the Figure 8A, but visible to residents at this location, are 115 kV power poles that run along South Washington Road. Visual quality of the view is considered low to moderate.

Viewer Concern

Visible to the north of the residences at KOP 4 are the Walnut Substation and peaking power plant on South Washington Road. The residential viewers represented by KOP 4 anticipate a rural agricultural landscape with prominent agricultural-related industrial facilities and energy infrastructure. The view from KOP 4 is lacking in notable scenic qualities. Viewer concern for residences at this location is considered moderate to high.

Viewer Exposure

The viewpoint is located less than one half mile from the WEC site and there are no obstructions that block views in the direction of the site. Visibility is thus high. There are a low number of viewers at this location, and because the viewers are residents, view duration is extended. Despite the high visibility and view duration, overall viewer exposure at KOP 4 is moderate, primarily as a result of the low number of viewers that have this view.

Overall Visual Sensitivity

For KOP 4, the low to moderate visual quality, moderate to high viewer concern, and the moderate exposure, result in moderate overall visual sensitivity.

KOP 5 – 115 kV Transmission Line Crossing of South Washington Road

KOP 5 was selected to show the existing view of the proposed route of the 115 kV transmission line (see **Visual Resources Figure 9A**). The viewpoint is located at the southeast corner of the Walnut Substation and peaking power plant on South Washington Road.

Visual Quality

The most prominent features in the view shown in Figure 9A are agricultural fields and the 69 kV transmission poles that currently traverse the WEC site. Visible from this location, but not shown in the figure, are the Foster Farms silos, rail spur, and 115 kV transmission poles on the west side of South Washington Road. Visual quality of the view is low to moderate.

Viewer Concern

The viewpoint is located at the TID Walnut Substation and peaking power plant. The employees who work at the substation and power plant are not considered to be sensitive visual receptors. The view is somewhat representative of the view available to

motorists on South Washington Road. Motorists would anticipate a rural agricultural landscape with prominent agricultural-related industries and energy infrastructure. The view does not contain any notable scenic qualities. Viewer concern of motorists is considered low to moderate.

Viewer Exposure

The transmission line route, and WEC site, are located in the foreground and are unobstructed from this viewpoint. Visibility is thus high. South Washington Road has an ADT of 1,853 vehicles per day (TID 2002a; p. 8.10-8), which indicates a low to moderate number of viewers. The distance from the West Main Street/South Washington Road intersection to the point where the proposed transmission line would cross South Washington Road is approximately 1,500 feet. The posted speed limit on South Washington Road is 45 MPH (TID 2002a; p. 8.10-7). Therefore, motorists travelling southbound on South Washington Road could potentially focus on the WEC site and transmission line route for approximately 22 seconds. Travelling northbound, from where the site first comes into view north of an orchard at South Washington Road and Clayton Road, motorists could potentially focus on the WEC site and transmission line route for approximately 30 seconds. View duration of motorists on South Washington Road is considered moderate. Overall viewer exposure is moderate.

Overall Visual Sensitivity

For motorists on South Washington Road, the low to moderate visual quality and viewer concern, and the moderate viewer exposure at KOP 5, result in low to moderate overall visual sensitivity at KOP 5.

IMPACTS

CONSTRUCTION IMPACTS

Project construction is expected to last 20 to 24 months. Construction of the proposed power plant and linear facilities would cause adverse visual impacts due to the presence of equipment, materials, and workforce at the WEC site and along the linear facility rights-of-way.

Construction laydown and parking areas would occupy approximately 27 acres of the 51-acre parcel owned by TID, and would be located immediately west of the WEC site. Construction activities at the WEC site would involve the use of cranes, heavy construction equipment, temporary storage and office facilities, and temporary laydown/staging areas. A typical construction spread for the pipelines would include a bulldozer, backhoe, boom trucks, excavation diggers, material delivery trucks, welding trucks and inspection vehicles. Most major pieces of equipment used to construct the pipelines would remain along the pipeline ROWs during construction of the lines. The laydown area adjacent to the WEC site would be used to store pipe and other pipeline construction materials. Additional storage areas would be located in existing paved or graveled areas along the pipeline ROWs. Construction would include site clearing and grading, digging for construction of underground linear facilities, construction of the actual facilities, and site and rights-of-way cleanup and restoration.

Construction activities at the WEC site and laydown area adjacent to the site would be most noticeable to residences at KOP 4 (South Washington Road) and the residence located at the end of Ruble Road. The temporary fence surrounding the laydown area would be approximately 600 to 800 feet from these residences, so presumably equipment and materials could be stored approximately this distance from the residences. The stored equipment and materials and parked cars would impart an untidy and chaotic appearance to an area that is currently used to grow summer corn and winter oats. Considering the low number of residential viewers that would be affected, and the short-term nature of project construction, the adverse visual impacts that would occur during construction would not be significant. However, this conclusion assumes that complete restoration of construction areas is accomplished. In addition, because the impacts would be adverse, staff proposes that the applicant attach semi-opaque to opaque mesh fabric screening material to the temporary fencing to be installed around the construction laydown area. Proper implementation of Condition of Certification **VIS-1** would ensure that the visual impacts associated with project construction remain less than significant.

There are numerous residences located along the pipeline routes that would have near foreground views of pipeline construction activities. Typically, pipeline construction activities (from site preparation to restoration) could potentially be viewed from any one residence for up to two weeks, with decreasing levels of visual clarity as the distance to construction activities increases. The proposed equipment and materials storage along the pipeline routes would not necessarily be out of character with the area because many properties along the routes include farm equipment storage sites. Given the limited duration that pipeline construction activities would be visible, the resulting visual impact would be less than significant. Again, this conclusion assumes that complete restoration of construction areas and rights-of-way is accomplished. Proper implementation of Condition of Certification **VIS-1** would ensure that the visual impacts associated with project construction remain less than significant.

The majority of construction activities would occur during daylight hours. However, during some construction periods, and during the startup phase of the project, some activities would continue 24 hours per day and would require nighttime lighting. In order to ensure that significant construction lighting impacts do not occur, staff recommends Condition of Certification **VIS-3**.

OPERATION IMPACTS

A detailed analysis of operation impacts was conducted for each of the view areas represented by the key observation points. The results of the operation impact analysis are discussed below by KOP and presented in the Visual Analysis Summary table included as **Visual Resources Appendix VR-1**. The visual impacts of night lighting and visible plumes are discussed in separate sections of this analysis. For each KOP, an evaluation of visual contrast, project dominance, and view blockage is presented with a concluding assessment of the overall degree of visual change caused by the proposed project.

Impacts of Power Plant Structures

As previously discussed, the most visually prominent structures of the WEC would be the HRSG units, the two HRSG stacks, the two brine concentrators, and the cooling tower. The HRSG units would be 65 feet tall and 100 feet long. The highest relief valves and vent silencers at the top of the HRSG units would reach a height of 105 feet. The HRSG stacks would be 132 feet tall and 17 feet in diameter. The brine concentrators would be 112 feet tall and 10 feet in diameter (17 feet at their base). The cooling tower would be 56 feet tall and 271 feet in length. The project also includes two 20-foot tall and 143-foot long combustion turbine generators (CTGs) and a 56-foot tall and 72-foot long steam turbine generator (STG).

KOP 1 – Ruble Road

Visual Contrast

Visual Resources Figure 5B presents a visual simulation of the proposed project as viewed from KOP 1 on Ruble Road. From this viewpoint on Ruble Road, only the tops of the cooling tower, brine concentrators, and HRSG stacks are visible above the house and agricultural building located in the middleground of the view. The WEC structures would be in full view from the residence located at the western end of Ruble Road. The cylindrical and geometric forms and straight lines of the WEC structures would be similar to, and thus would not contrast with, the cylindrical forms and straight lines of the Foster Farms facility, which is the dominant existing structure in the view toward the site. The medium gray color of the project structures would contrast moderately with the colors of the landscape features, which include the light grays of the irrigation canal and Foster Farms silos, the green agricultural field, and blue sky. The overall visual contrast of the project structures with the existing setting would be low.

Project Dominance

The project structures that would be visible from KOP 1 would appear small compared to the much larger Foster Farms silos and the broad, panoramic view available from this viewpoint. Thus, scale dominance would be subordinate. The sky backdrop to the project would contribute to the structural prominence of the proposed facilities. Spatial dominance is rated co-dominant. Overall project dominance is subordinate to co-dominant at KOP 1. Overall project dominance would be co-dominant to dominant as viewed from the closest residence to the site, located at the western end of Ruble Road.

View Disruption

Other than a very small portion of the sky, the project structures would not block from view any high quality landscape features. The severity of the view disruption is considered low.

Overall Visual Change

From KOP 1, the overall visual change caused by the proposed project would be low to moderate due to the low degree of contrast that would occur from the project's subordinate structures, combined with the project's low degree of view disruption. Overall visual change from the residence at the western end of Ruble Road would be moderate.

Visual Impact Significance

When considered within the context of the moderate visual sensitivity of the existing landscape and viewing characteristics, the low-to-moderate to moderate degree of visual change that would be perceived from the area of KOP 1 would cause an adverse but less than significant visual impact.

KOP 2 – West Main Street and Washington Road

Visual Contrast

Visual Resources Figure 6B presents a visual simulation of the project as viewed from KOP 2 at the intersection of West Main Street and Washington Road. The geometric forms and straight lines of the project structures would appear consistent with the forms and lines of the agricultural-related industrial facilities (i.e., Foster Farms and Del Mesa Farms) located to the east of the WEC site. The gray color of the proposed structures would match the gray color of the existing industrial facilities. Color contrast would be low with the sky, and moderate with the green agricultural field. Overall, visual contrast would be low.

Project Dominance

The proposed project structures would appear comparable in size to the existing built structures, and subordinate to the wide field of view available at KOP 2. The structures would be located prominently within the view, with the sky backdrop contributing to the structural prominence of the project structures. The overall dominance of the project structures is rated co-dominant.

View Disruption

The project structures would block from view a small grove of trees that are currently visible in the distant background. These trees are often partially blocked by rail cars parked on the Foster Farms railroad spur tracks. The project would also block a small part of the sky. The severity of the view disruption is considered low to moderate.

Overall Visual Change

From KOP 2, the overall visual change caused by the proposed project would be low to moderate due to the low degree of contrast that would occur from the project's co-dominant structures, combined with the project's low to moderate degree of view disruption.

Visual Impact Significance

When considered within the context of the moderate visual sensitivity of the existing landscape and viewing characteristics, the low to moderate visual change that would be perceived from KOP 2 would cause an adverse but less than significant visual impact.

KOP 3 – 425 Commons Road

Visual Contrast

Visual Resources Figure 7B presents a visual simulation of the project as viewed from KOP 3, located at 425 Commons Road, just north of the Union Pacific Railroad tracks. The geometric forms and straight lines of the project would be similar to the geometric forms and straight lines established by the existing built structures visible from KOP 3. These structures include the Foster Farms silos and the prominent tubular steel transmission poles. The gray color of the proposed structures would blend well with the sky backdrop to the project and the gray colors of the existing built structures. Overall visual contrast would be low.

Project Dominance

The project would appear small in comparison to the existing transmission poles and to the wide field of view available at KOP 3, so scale dominance would be rated subordinate. The project structures would be noticeable from this viewpoint as a result of the sky backdrop to the project. Spatial dominance is thus rated co-dominant. Overall project dominance would be subordinate to co-dominant.

View Disruption

A small amount of sky is the only landscape feature of high visual quality that would be blocked from view by the project structures. Considering this, the severity of the view disruption is considered low.

Overall Visual Change

From KOP 3, the overall visual change caused by the proposed project would be low to moderate due to the low degree of contrast that would occur from the project's subordinate to co-dominant structures, combined with the project's low degree of view disruption.

Visual Impact Significance

When considered within the context of the moderate visual sensitivity of the existing landscape and viewing characteristics, the low to moderate visual change that would be perceived from KOP 3 would cause an adverse but less than significant visual impact.

KOP 4 – 807 South Washington Road

Visual Contrast

Visual Resources Figure 8B presents a visual simulation of the project as viewed from KOP 4, located at 807 South Washington Road, north of Clayton Road. The geometric forms and straight lines of the project would be similar to the forms and lines of the existing built structures, which include the Foster Farms and Del Mesa Farms silos, the Simon Newman feed mill, the California Diaries facility, and the 69 kV transmission poles. The gray colors of the project would blend well with the color of the existing structures and the sky. Overall visual contrast would be low.

Project Dominance

The proposed project would appear comparable in size to the Foster Farm silos and would occupy a moderate portion of the view from KOP 4. The project structures would be spatially prominent in the view from KOP 4. The sky backdrop would contribute to the structural prominence of the project. Overall project dominance would be co-dominant.

View Disruption

The project would block from view a small part of the sky that is visible between the existing industrial facilities in the background. It would also block from view some of the existing built structures. The severity of the view blockage is considered low.

Overall Visual Change

From KOP 4, the overall visual change caused by the proposed project would be low to moderate due to the low degree of contrast that would occur from the project's co-dominant structures, combined with the project's low degree of view disruption.

Visual Impact Significance

When considered within the context of the moderate visual sensitivity of the existing landscape and viewing characteristics, the low to moderate visual change that would be perceived from KOP 4 would cause an adverse but less than significant visual impact.

Linear Facilities

Natural Gas and Water Supply Pipelines

The proposed underground natural gas supply pipeline would not be visible following installation except for an occasional warning marker. The markers would likely go unnoticed by passerby and therefore would not result in adverse visual impacts. The water supply pipelines would be entirely underground and therefore would not cause adverse visual impacts during operation.

Electrical Transmission Lines

The proposed 670-foot-long 69 kV transmission line would require two new wood or steel poles to interconnect with the existing 69 kV line that runs along Ruble Road and the south property line of the 69-acre parcel owned by TID. The new 69 kV poles would be most visible to the residence located at the western end of Ruble Road. The new poles would be seen in the context of the existing wood poles on Ruble Road, which are located closer to the residence than the new poles would be. The visual contrast, dominance, and view disruption of these new poles would range from low to low to moderate. The visual impact of the proposed 69 kV transmission line would be adverse but not significant.

KOP 5 – 115 kV Transmission Line Crossing of South Washington Road

Visual Contrast

Visual Resources Figure 9B presents a visual simulation of the proposed 115 kV transmission line as viewed from KOP 5, located at South Washington Road and the Union Pacific Railroad tracks. The viewpoint is from the road, at the southeast corner of the Walnut Substation and peaking power plant property. Not shown in the photograph, but visible to motorists on South Washington Road, are the Foster Farms silos, the Walnut Substation and peaking plant, and existing transmission poles that run along South Washington Road. The proposed 115 kV transmission poles would be similar in form and line to existing transmission poles. Although the proposed brown color of the poles would contrast highly with the blue sky backdrop, the proposed color would be consistent with the brown and green colors of the agricultural fields the lines would cross and the brown color of the existing transmission poles along South Washington Road. Overall visual contrast of the transmission line with the existing setting would be low to moderate.

Project Dominance

The transmission poles closest to the South Washington Road would appear comparable in scale to the existing transmission poles along the roadway. The poles farther away from the road would appear much smaller than the existing visible built structures. The new poles would occupy a small part of the wide field of view available from South Washington Road. Scale dominance of the power poles would be subordinate. The poles would be back dropped by sky, so their spatial dominance is rated co-dominant. Overall dominance of the transmission poles is considered subordinate to co-dominant.

View Disruption

The transmission poles would interrupt a minor amount of the sky. No other notable landscape features of high visual quality would be blocked. The severity of the view disruption is considered low.

Overall Visual Change

From KOP 5, the overall visual change caused by the proposed project would be low to moderate due to the low to moderate degree of contrast that would occur from the project's subordinate to co-dominant structures, combined with the project's low degree of view disruption.

Visual Impact Significance

When considered within the context of the low to moderate visual sensitivity of the existing landscape and viewing characteristics, the low to moderate visual change that would be perceived from KOP 5 would cause an adverse but less than significant visual impact.

Lighting

The proposed project would be located in an agricultural area with prominent industrial facilities and scattered residences. The industrial facilities and residences are sources of existing nighttime lighting in the area. The WEC would require nighttime lighting for operational safety and security. Uncontrolled lighting would have the potential to cause significant adverse visual impacts on nearby sensitive visual receptors, such as residences along Ruble Road. However, TID proposes various mitigation measures to reduce offsite visibility and potential glare impacts of the WEC's lighting (TID 2002a, p. 8.11-12). For instance, lighting would be restricted to areas required for safety, security, and operation. For areas where lighting would not be required for normal operation, safety, or security, or for high illumination areas not occupied on a regular basis, switched lighting circuits or motion detectors would be provided, to light these areas only when occupied. Exterior lights would be hooded, and lights would be directed onsite to illuminate only those areas needed to be lit. Low-pressure sodium lamps and fixtures of a non-glare type would be used. Staff has incorporated these measures into proposed Condition of Certification **VIS-4**.

To the extent feasible and consistent with worker safety codes, lighting that may be installed to facilitate nighttime construction activities would be directed toward the center of the construction site and shielded to prevent light from straying offsite. Task-specific construction lighting would be used to the extent practical while complying with worker safety regulations (TID 2002a, p. 8.11-2). Staff has proposed Condition of Certification **VIS-3** to mitigate construction lighting impacts.

Cooling Tower and Combustion Exhaust Visible Plumes

The WEC would include a five-cell mechanical draft cooling tower and two separate turbine/heat recovery steam generator (HRSG) systems, each with separate exhaust stacks. TID has not proposed to use any methods to abate visible plumes from the cooling tower or HRSG exhausts. Staff completed a visible plume modeling analysis of the proposed unabated cooling tower and HRSG exhausts (Walters 2003a; see **Visual Resources Appendix VR-2**). The following discussion summarizes the results of staff's analysis.

Cooling Tower Plume Modeling Analysis

Staff modeled the cooling tower plumes using both the Combustion Stack Visible Plume (CSVP) model and the Seasonal/Annual Cooling Tower Impact (SACTI) model. The SACTI model is designed to model multiple cell cooling towers, and for the CSVP modeling analysis uses an equivalent stack diameter approach in order to model the entire exhaust water emissions of the tower. **Visual Resources Table 3** provides the CSVP model visible plume frequency results using a five-year (1990-1994) meteorological data set, obtained from the National Climatic Data Center, from Fresno.

Visual Resources Table 3 – Staff Predicted Hours with Cooling Tower Steam Plumes Fresno 1990-1994 Meteorological Data

Full Load Operation	Available (hr)	Plume (hr)	Percent
All Hours	43,824	19,738	45.0%
Daylight Hours	22,190	6,329	28.5%
Nighttime Hours	21,634	13,409	62.0%
Daytime No Rain No Fog Hours	18,349	3,419	18.6%
Seasonal Daylight Hours	10,031	5,413	54.0%
Seasonal Daylight No Rain No Fog Hours	6,560	2,662	40.6%

*Seasonal conditions occur anytime from November through April.

These results confirm that the visible plume formation would occur predominately during the cold weather months, with the majority of plume formation occurring at night or morning hours.

For the proposed cooling tower during seasonal (November through April) daylight no rain no fog (SDNRNF) hours, the minimum relative humidity where a visible plume is predicted is 21 percent at 46°F when operating with four cooling tower cells. The maximum temperature where a visible plume is predicted during SDNRNF hours is 66°F at 76 percent relative humidity.

Staff's SACTI modeling analysis visible plume dimension results, using the same five-year (1990-1994) meteorological data set from Fresno, compared to the CSVP model results are provided in **Visual Resources Table 4**.

Cloud Cover Data Analysis Method

A plume frequency of 10 percent of SDNRNF high visual contrast (i.e. "clear") hours is used to determine potential plume impact significance. The high visual contrast hours analysis methodology is as follows:

Energy Commission staff has identified a "clear" sky category during which plumes have the greatest potential to cause adverse visual impacts. For this project the meteorological data set[2] used in the analysis categorizes total sky cover and opaque sky cover in 10 percent increments. Staff has included in the "Clear" category a) all hours with total sky cover equal to or less than 10 percent plus b) half of the hours with total sky cover 20-100 percent that have sky opacity equal to or less than 50 percent. The rationale for including these two components in this category is as follows: a) plumes typically contrast most with sky under clear conditions and, when total sky cover is equal to or less than 10 percent, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear; and b) for a substantial portion of the time when total sky cover is 20-100 percent and the opacity of sky cover is relatively low (equal to or less than 50 percent), clouds do not substantially reduce contrast with plumes; staff has estimated that approximately half of the hours meeting the latter sky cover and sky opacity criteria can be considered high visual contrast hours and are included in the "clear" sky definition.

[2] This analysis uses a Fresno Hourly US Weather Observations (HUSWO) meteorological data set obtained from the National Climatic Data Center (NCDC).

Visual Resources Table 4 – Staff Results of Cooling Tower Visible Plume Dimensions Sacramento 1990-1993 Meteorological Data

All Hours	Percentile	SACTI Model	CSVP Model
Length (m)	25%	60-70	218
	10%	300-400	1,331
	5%	400-500	3,112
	1%	2000-3000	>5,000
	Maximum	>10,000	>5,000
Height (m)*	25%	30-40	145
	10%	90-100	221
	5%	100-200	260
	1%	200-300	935
	Maximum	900-1000	>2,000
Width (m)	25%	40-60	77
	10%	80-100	130
	5%	80-100	202
	1%	120-140	747
	Maximum	800-1000	>1,000
Daytime No Rain/Fog Hours			
Length (m)	25%	30-40	No plume
	10%	40-50	52
	5%	200-300	134
	1%	500-600	450
	Maximum	>10,000	>5,000
Height (m)*	25%	20-30	No plume
	10%	30-40	68
	5%	70-80	139
	1%	200-300	431
	Maximum	>1,000	>2,000
Width (m)	25%	20-40	No plume
	10%	40-60	50
	5%	60-80	62
	1%	80-100	100
	Maximum	800-1,000	>1,000
Seasonal Daytime No Rain/Fog Hours			
Length (m)	25%	40-50	45
	10%	200-300	165
	5%	500-600	288
	1%	1,000-2,000	724
	Maximum	>10,000	>5,000
Height (m)*	25%	20-30	61
	10%	70-80	161
	5%	200-300	280
	1%	200-300	779
	Maximum	>1,000	>2,000
Width (m)	25%	40-60	49
	10%	60-80	67
	5%	60-80	82
	1%	100-120	138
	Maximum	800-1,000	>1000

Seasonal = November through April (day 120-304).

*SACTI Plume height does not include the height (17.1meters) of the cooling tower (release point).

If it is determined that the SDNRNF clear hour plume frequency is greater than 10 percent, then plume dimensions are determined and staff conducts a visual impact analysis of the anticipated plumes during clear hours. The results of the high visual contrast hours analysis is provided in **Visual Resources Table 5**.

Visual Resources Table 5 – Staff Predicted Cooling Tower Plume Hours by Cloud Cover Type

Plume Hours by Cloud Cover Type					
All		Clear		Scattered/Broken/Overcast	
Hours	%	Hrs	%	Hours	%
2,662	40.6%	1,179	17.9	1,483	22.6

* - Percentiles are calculated by dividing the number of plume hours by the reference number of seasonal daylight no rain no fog hours (6,560).

The frequency of the cooling tower plumes during clear SDNRNF hours is predicted to be 17.9 percent. Because the cooling tower plumes would exceed staff's 10 percent frequency threshold, staff calculated the dimensions of the plumes. The clear sky plume dimensions estimated by the CSVP model are as follows:

Visual Resources Table 6 – Staff Predicted Clear SDNRNF Cooling Tower Plume Dimensions

	Cooling Tower Clear Plume Dimensions		
Percentile	Length	Height	Width
1%	544 (1,784)	600 (1,967)	120 (393)
5%	135 (443)	163 (535)	65 (214)
10%	50 (164)	76 (251)	51 (167)
15%	13 (43)	37 (121)	39 (128)

SDNRNF – Seasonal Daylight No Rain No Fog
Data provided in meters and (feet)

The 10th percentile WEC cooling tower plume dimensions are predicted to be 164 feet in length, 251 feet in height, and 167 feet in width. The 10th percentile plume is the smallest of the plumes that are predicted to occur zero to 10 percent of the time, and it is the largest of the plumes that are predicted to occur greater than 10 percent of the time (refer **Visual Resources Table 6**). Staff considers the 10th percentile plume to be a reasonable worst case for its visual impact analysis of the plumes.

Due to the openness of the project site and surrounding area, the frequency and large sizes of the WEC cooling tower plumes would cause a noticeable but intermittent change in the landscape character when viewed from both near and more distant vantage points. The plumes would be most prominent as viewed from within the foreground distance zone (0.5 mile), which is the area represented by KOPs 1, 2, 4, and 5. The area within approximately 0.5-mile of the site is sparsely populated. The plumes would be particularly noticeable to residences within this zone that are located along Ruble Road (approximately nine residences), West Main Street (approximately five residences) and South Washington Road (approximately six residences). The plumes would also be prominently visible to motorists on West Main Street and South Washington Road. The cooling tower plumes would appear as prominent, billowing linear-to-irregular forms with irregular and changing outlines. The plumes would be moving forms, originating near ground level and rising vertically and then diagonally

across the sky. The movement of the plumes would be noticeable from foreground viewing locations, and less noticeable from middleground to background viewing locations.

There are several industrial facilities in the immediate project area that emit visible water plumes, such as Foster Farms, Simon Newman Feed Mill, and California Dairies. The visible water plume sources are from primarily agricultural processing, rather than combustion or cooling. Visible water vapor plumes from the agricultural plume sources, although not as large as those that may occur from the proposed WEC cooling tower, would likely occur at a higher frequency than the proposed WEC project plumes, particularly the HRSG plumes, because the existing plume sources have a much higher moisture content than combustion or cooling tower exhausts and therefore would have visible plumes over a much greater range of ambient conditions (Walters 2003b). The existing plumes are visible from nearby roadways, such as West Main Street, and from nearby residences, such as those along Ruble Road.

Under clear sky viewing conditions, the white cooling tower plumes would contrast highly with the blue sky background. The vertical and diagonal, irregular and changing form of the plume would distinguish the plume from the broad, horizontal, natural landforms and the generally uniform appearance of sky. The WEC cooling tower plumes would appear similar in form, line, and color to the existing water vapor plumes in the vicinity of the project site. Overall visual contrast with the existing setting is considered moderate.

The 10th percentile plume height is predicted to be 251 feet from ground level. Plumes of this height would be taller than the Foster Farms silos, the tallest of which are 170 feet tall (TID 2002a; p. 8.11-1), and larger than the existing plumes emanating from Foster Farms and the other industrial facilities in the project vicinity. Intermittently, the WEC cooling tower plumes would become the major feature in the immediate project area. The movement of the plumes, their elevated position above the viewers in the area, and their backdrop against the sky would all contribute to the prominence of the plumes. The overall dominance rating of the WEC cooling tower plumes is co-dominant to dominant.

When the plumes are present, they would block portions of the sky. No other unique of notable scenic features would be blocked by the plumes. View disruption is considered low to moderate.

The overall visual change caused by the WEC cooling tower plumes would be moderate to high due to the plumes' moderate degree of contrast with the existing setting and their co-dominant to dominant dominance rating, combined with the low to moderate degree of view disruption (sky). When considered within the context of the moderate visual sensitivity of the existing landscape and viewing characteristics, the moderate to high degree of visual change caused by the WEC cooling tower plumes would result in an adverse but less than significant impact. Staff is proposing Condition of Certification **VIS-6** to ensure that the cooling tower is designed and operated so that the plume frequency would not increase from the design proposed by the applicant. Staff's recommended Condition of Certification **VIS-6** is based on the cooling tower design and operating information provided by the applicant. One of the specific operating

assumptions is that during cold weather the cooling tower, under maximum load conditions, would be operated using only four of the five cells. The visible plume modeling analysis, using input from the applicant, assumed that the four cell operation would begin at 46 degrees Fahrenheit. Additional modeling would have to be performed to confirm that the visible plume impacts would still be less than significant if the applicant were to revise this operating assumption.

HRSG Visible Plume Modeling Analysis

Staff evaluated the AFC (TID 2002a, AFC Appendix 8.1A) and performed an independent psychrometric analysis and dispersion modeling analysis. The CSVP model was used to estimate the worst-case potential plume frequency for each HRSG stack (Walters 2003).

Staff modeled the HRSG plumes using the CSVP model with a five-year meteorological data set from Fresno. **Visual Resources Table 7** provides the CSVP model visible plume frequency results.

Visual Resources Table 7 – Staff Predicted Hours with HRSG Steam Plumes Fresno 1990-1994 Meteorological Data

Case	Available (hr)	100% Load		50% Load	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	43,818	764	1.7%	4,977	11.36%
Daylight Hours	22,190	131	0.6%	1,055	4.75%
Daylight No Rain No Fog	18,349	10	0.1%	150	0.82%
Seasonal Daylight Hours*	10,031	131	1.3%	1,051	10.48%
Seasonal Daylight No Rain No Fog*	6,560	10	0.2%	149	2.27%
Seasonal Daylight Clear*	6,560	10	0.2%	101	1.54%

*Seasonal conditions occur anytime from November through April.

For the proposed HRSGs, the maximum temperature where a visible plume is predicted is 38°F when the relative humidity is 100 percent when operating at 100 percent load and 52°F when the relative humidity is 100 percent when operating at 50 percent load.

A plume frequency of 10 percent of seasonal (November through April) daylight clear hours is used as a plume impact study threshold trigger. The HRSG plume frequencies are predicted to be well less than 10 percent of seasonal daylight clear hours. Therefore, the HRSG exhausts are not expected to cause significant visual impacts under the expected operating conditions, and no further visual plume impact analysis is necessary to address the impacts from the HRSG plumes.

CUMULATIVE IMPACTS

As defined in Section 15355 of the CEQA Guidelines (Cal. Code Regs., tit. 14), a cumulative impact consists of an impact created as a result of the combination of the project together with other projects causing related impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Cumulative impacts to visual resources could occur where project facilities or activities (such as construction) occupy the same field of view as other built facilities or impacted landscapes. It is also possible that a cumulative impact could occur if a viewer's perception is that the general visual quality of an area is diminished by the proliferation of visible structures (or construction effects such as disturbed vegetation), even if the new structures are not within the same field of view as the existing structures. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; or (3) visual quality is diminished.

According to the AFC, the City of Turlock is in the process of preparing the Westside Industrial Specific Plan (WISP). The intent of the WISP is to encourage industrial development of the industrially zoned area in which the WEC would be located (TID 2002a; pp. 8.11-3 and 8.11-18). According to the Visual Resources section of the AFC, no major projects are presently known to be in the planning stages for the area in the immediate vicinity of the project site. The Land Use section of the AFC identified two planned or approved projects within one mile of the WEC site. These projects are described as being a remodeling of the Sunnyside Farms facility (primarily limited to interior remodeling) and an expansion of a water line to the existing Varco-Pruden facility. Given the nature of these identified projects, the WEC project would not combine together with these projects to produce cumulative visual impacts.

Currently, there are a number of existing and prominent industrial facilities in the vicinity of the proposed WEC site. These facilities include the following: the Foster Farms Foster Commodities West Main silos, Del Mesa Farms, Simon Newman Feed Mill, California Dairies, Associated Feed and Supply, and the Walnut Substation and peaking power plant. All of these facilities have a complex industrial character, and at least three of these facilities emit water vapor plumes. The proposed project would be similar in character (form, line, and color) and scale (although the WEC plumes would be larger) to these existing facilities. Given that the area is sparsely populated and already contains a number of prominent industrial facilities of similar character and scale to the proposed project, the WEC's contribution to cumulative visual impacts would not be cumulatively considerable.

CONSIDERATION OF IMPACTS IN RELATION TO CEQA SIGNIFICANCE CRITERIA

This analysis considered the potential impacts of the proposed project structures in relation to the four significance criteria for visual resource impacts listed in Appendix G of the CEQA Guidelines, under Aesthetics, specified below.

1. Would the project have a substantial adverse effect on a scenic vista?
   There are no scenic vistas in the project viewshed so the proposed project would not result in significant visual impacts under this criterion.
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

The proposed project is not located within the viewshed of a State Scenic Highway. The site does not contain any notable scenic resources, such as trees, rock

outcroppings or historic buildings. Thus, the project would have no impact under this criterion.

3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

As discussed previously in this analysis, the visual quality of the WEC site and vicinity was characterized as having low to moderate visual quality. Operation of the proposed project would result in adverse but less than significant visual impacts, and therefore the project would not substantially degrade the existing visual quality or character of the site and its surroundings either directly or cumulatively.

4. Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

The applicant has proposed measures to minimize potential glare from project structures and impacts from nighttime lighting. With the implementation of standard conditions of certification to ensure proper treatment of structural surfaces and to control nighttime lighting, the project would not substantially affect daytime and nighttime views in the area.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed WEC power plant (please refer to **Socioeconomics Figure 1** in this Preliminary Staff Assessment). However, as indicated in Socioeconomics Figure 1, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff considers these to be pockets or clusters. Staff also reviewed Census 2000 information that shows the low-income population is less than fifty percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis. In the case of visual resources, staff has not identified unmitigated significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no visual resources environmental justice issues related to this project.

FACILITY CLOSURE

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

Planned closure 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 will address removal of the power plant structures.

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

Unexpected permanent closure 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 would address removal of the power plant structures. No special conditions regarding visual resources are expected to be required to address any of the three types of closure.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LOCAL

Visual Resources Table 8 provides a listing of the applicable LORS for the City of Turlock and Stanislaus County. With the applicant's proposed mitigation measures and staff's proposed conditions of certification, the project would be consistent with applicable local LORS relevant to visual resources.

Visual Resources Table 8
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
City of Turlock General Plan	Industry Implementing Policy 2.5-h: Design industrial development to minimize potential community impacts adversely affecting residential and commercial areas in relation to …visual quality…	Yes	TID's decision to site the power plant in the northeast quadrant of the 69-acre property, as close to the Foster Farms silos as possible, helps to minimize the visual impacts of the project on nearby residences. The project has been designed so that the tallest elements of the project, the HRSG stacks, align with the tall silos to the north. TID proposes other measures to minimize the visual impacts of the project, such as daytime glare and nighttime lighting impacts. Implementation of these measures would be ensured by staff's proposed Conditions of Certification

Visual Resources Table 8
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
	Industry Implementing Policy 2.5-i: Buffer industrial and heavy commercial areas from adjacent residential, commercial, and recreation areas.	Yes	According to the City, the intent of this policy is to avoid having industrial areas immediately abutting a residential neighborhood (CH2Mhill 2003c). The project would not immediately abut a residential neighborhood. The project is located within an industrial zoned area. The surrounding area is agricultural with scattered rural, residential uses. From residences east, northeast, and southeast of the of the project site, the WEC structures would be partially to fully screened by the Foster Farms silos and other intervening industrial facilities. Residences on South Washington Road to the west of the WEC site would have unobstructed views of the project structures. The residence at the western end of Ruble Road would be the closest to the WEC site. It would be located approximately 625 feet south, southeast of the cooling tower, which is the WEC structure closest to the southern site boundary. If the remainder of the TID parcel remains in agricultural use, the crops (corn) would provide some visual screening for a part of the year (June to September). The applicant cites a number of reasons why they are unwilling to plant trees or shrubs along the southern and western boundary of the TID parcel to provide a visual buffer between the plant and residences at KOP 4 and at the western end of Ruble Road (Ch2MHill 2003f). As an alternative, TID is willing to plant trees offsite at these residences to provide additional visual screening of the project if these
	City Design Element Policy 7.4-d: Enhance the visual attractiveness of the community by providing attractive streetscapes, particularly along major expressways, arterials, and collector streets.	Yes	TID proposes to provide landscaping at the WEC site entrance at South Washington Road, pursuant to direction received from the City of Turlock (CH2MHill 2003f; TID 2002a; TID 2002b). Conformance with this policy would be ensured by staff's proposed Condition of Certification

Visual Resources Table 8
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
	City Design Element Policy 7.4-h: Subject all development projects and capital improvements within view of a designated Gateway Route to mandatory design review procedures.	Yes	TID intends on submitting the project to the City for Design Review. Conformance with this policy would be ensured by staff's proposed Conditions of Certification **VIS-2**, **-4**,
City of Turlock Zoning Ordinance	9-2-109 Landscaping and Irrigation The purpose and intent is to establish landscaping regulations that are intended to: (a)(1): Enhance the aesthetic appearance of development in all areas of the City by providing standards relating to quality, quantity, and functional aspects of landscaping and landscape screening. (a)(2): Increase compatibility between residential and abutting commercial and industrial uses. (a)(5): Protect public health, safety, and welfare by	Yes	To comply with the landscaping requirements of the zoning ordinance, TID proposes to install landscaping at the driveway entrance to the WEC at South Washington Road, pursuant to direction received from the City of Turlock (TID 2002a and 2002b). In compliance with the City's design review process, TID will submit a landscape plan to the City during construction of the project. Conformance with this zoning requirement would be ensured by staff's proposed Condition of Certification **VIS-5**. The project would not abut any residential uses. Operation of the WEC would not result in significant adverse visual impacts on nearby sensitive visual receptors. To further reduce adverse visual impacts at KOP 4 and the residence located at the western end of Ruble Road, the applicant is willing to plant landscaping at these residences to reduce the visibility of the project if the property owners are interested (CH2MHill 2003f). Staff
	9-2-118 Screening of mechanical equipment: Exterior mechanical equipment, except solar collectors and residential utility meters, shall be screened from view on all sides. Equipment to be screened includes, but is not limited to, heating, air conditioning, refrigeration equipment, plumbing lines, duct work, and transformers.	Yes	According to the City, this ordinance is not applicable to a facility such as the proposed WEC (e.g., the mechanical equipment attached to the HRSG units), and is intended for facilities such as automobile wrecking and storage, industrial subdivisions, and outdoor storage (non-vehicular) (CH2MHill 2003c). The distance between the WEC facilities and publicly accessible viewing areas and proper treatment of structural surfaces (**VIS-2**) would reduce the visibility of the equipment (vents, silences, steam drums) attached to the top of the HRSGs.

Visual Resources Table 8
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
	9-3-403 Industrial district property development standards: Height: No maximum height Landscaping: see Subsection 9-2-109 Landscaping and Irrigation.	Yes	See above discussion for Zoning Ordinance 9-2-109 Landscaping and Irrigation.
County of Stanislaus General Plan	Conservation/Open Space Element Goal One: Encourage the protection and preservation of natural and scenic areas throughout the County.	Yes	Portions of the project's underground gas and water pipelines and 115 kV electric transmission line are located within the County. The gas and water line would have no impact on natural and scenic areas of the County after installation and remediation of the ground surface is complete. The proposed 115 kV transmission line would not be located within a scenic area. It would be located within an area with existing electrical infrastructure (transmission lines and substation), and its impact on visual resources would be less than significant.

MITIGATION

APPLICANT'S PROPOSED MITIGATION MEASURES

The applicant proposes the following mitigation measures to reduce the project's impacts on visual resources.

Power Plant

- Minimize lighting to areas required for safety, security, or operations, and shield lighting from public view to the extent possible. Timers and sensors will be used to minimize the time that lights are on in areas where lighting is not normally needed for safety, security, or operation.
- Highly directional light fixtures will be used. Direct and shield lighting to reduce light scatter and glare.

- Signage will be minimal. Project signs will be constructed of non-glare materials and unobtrusive colors.

Transmission Lines

- Poles will be constructed of wood or steel to create a trim profile that will coordinate with the existing transmission facilities.
- Poles will be treated, as necessary, to maximize their visual integration into the backdrop
- Insulators will be non-reflective and non-refractive.

Pipelines

- After construction, ground surfaces will be restored to their original condition, and any vegetation that had been removed during the construction process will be replaced with like-kind vegetation.
- All aboveground gas facilities will be located at the project site inside the project fence.

ADDITIONAL MITIGATION PROPOSED BY STAFF

Energy Commission staff generally agrees with the applicant's proposed mitigation measures. However, staff's position is that some of these measures need to be more precisely developed in conditions of certification which staff proposes below.

CONCLUSIONS AND RECOMMENDATIONS

The project as proposed would not cause significant adverse visual impacts during construction or operation. With full and effective implementation of the applicant's mitigation measures and staff's proposed conditions of certification, visual impacts would be kept to less than significant levels, and the project would be built consistent with all applicable LORS relevant to visual resources. Staff recommends that the Energy Commission adopt the following conditions of certification if it approves the project.

CONDITIONS OF CERTIFICATION

VIS-1 The project owner shall visually screen the project site and construction equipment and material laydown area by attaching mesh fabric or other screening material to the temporary fencing. The screening material shall be of an appropriate design, opacity, and color as determined by the Energy Commission Compliance Project Manager (CPM). The project owner shall remove all evidence of construction activities, and shall restore the ground surface to the original or improved condition, including the replacement of any vegetation or paving removed during construction.

Verification: At least 90 days prior to the start of site mobilization, the project owner shall submit a screening plan, including a sample of the screening material, to

the CPM for review and approval. At least 90 days prior to the start of commercial operation, the project owner shall submit the surface restoration plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the screening and surface restoration plans are needed, within 30 days of receiving that notification the project owner shall submit to the CPM plans with the specified revisions.

The project owner shall install the screening material prior to the start of ground disturbance. The project owner shall complete surface restoration within 60 days after the start of commercial operation.

The project owner shall notify the CPM within seven days after installing the screening and completing the surface restoration that the screening and restoration are ready for inspection.

VIS-2 The project owner shall treat the surfaces of all project structures, equipment, and buildings visible to the public such that their colors minimize visual intrusion and contrast by blending with the landscape; their surfaces do not create excessive glare; and they are consistent with local laws, ordinances, regulations, and standards. The project owner shall submit for CPM review and approval and to the City of Turlock for review and comment, a specific treatment plan the proper implementation of which will satisfy these requirements. The submittal to the CPM shall include the City's comments. The treatment plan shall include:

a) Specification, and 11" x 17" color simulations at life size scale when viewed at 18 inches, of the treatment proposed for use on project structures, including structures treated during manufacture;

b) A list of each major project structure, equipment, building, tank, pipe, transmission line tower and/or pole, and fencing specifying the color(s) and finish proposed for each (colors must be identified by name and by vendor brand or a universal designation). The transmission line conductors shall be non-specular conductors and non-reflective, and the insulators shall be non-refractive;

c) Two sets of brochures and/or color chips for each proposed color;

d) Samples with dimensions of at least five inches by seven inches of each proposed treatment and color on each material to which they would be applied that would be visible to the public;

e) A detailed schedule for completion of the treatment; and

f) A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated on site, until the project owner receives notification of approval of the treatment plan by the CPM.

Verification: The project owner shall submit its proposed treatment plan at least 90 days prior to ordering the first structures that are color treated during manufacture.

Prior to commercial operation, the project owner shall notify the CPM that all buildings and structures are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-3 The project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

a) All lighting shall be of minimum necessary brightness consistent with worker safety;
b) All fixed position lighting shall be shielded, hooded, and directed downward to minimize direct illumination of the night sky and direct light trespass (direct lighting extending outside the boundaries of the construction area);
c) Wherever feasible and safe, lighting shall be kept off when not in use and motion detectors shall be employed; and
d) A lighting complaint resolution form (following the general format of that in **Visual Resources Appendix VR-3**) shall be maintained by plant construction management, to record all lighting complaints received and to document the resolution of that complaint.

Verification: Within seven days after the first use of construction lighting, the project owner shall notify the CPM that the lighting is ready for inspection.

If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 15 days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM that the modifications have been completed.

The project owner shall report any lighting complaints and documentation of resolution in the Monthly Compliance Report.

VIS-4 The project owner shall design and install all permanent lighting such that light bulbs and reflectors are not visible from public viewing areas; lighting does not cause reflected glare; and illumination of the project, the vicinity, and the nighttime sky is minimized. To meet these requirements the project owner shall ensure that:

a) Lighting shall be designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that direct illumination of the night sky is minimized. The design of the lighting shall be such that the luminescence or light source is shielded to reduce light trespass outside the project boundary while taking into consideration security concerns.

b) All lighting shall be of minimum necessary brightness consistent with worker safety and security concerns;

c) High illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have switches or motion detectors to light the area only when occupied; and

d) Plant operations staff shall 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. A lighting complaint resolution form (following the general format of that in **Visual Resources Appendix VR-3**) shall be maintained by plant operations management to record all lighting complaints received and to document the resolution of that complaint.

Verification: At least 90 days prior to ordering any permanent exterior lighting, the project owner shall contact the CPM to arrange a meeting to discuss the documentation required in the lighting mitigation plan.

At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and approval and to the City of Turlock for review and comment written documentation describing the lighting control measures and fixtures, hoods, shields proposed for use. The submittal to the CPM shall include the City's comments. The project owner shall incorporate the CPM's comments in lighting equipment orders.

Prior to first combustion of the gas turbine, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection.

If the CPM notifies the project owner that modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

The project owner shall report any complaints about permanent lighting and provide documentation of resolution in the Annual Compliance Report for that year.

VIS-5 The project owner shall provide landscaping at the WEC site consistent with policies and requirements of the City of Turlock General Plan and Zoning Ordinance. At a minimum, the project owner shall provide landscaping at the driveway entrance to the WEC site. The project owner shall provide offsite landscaping to reduce the visibility of the project from the residences represented by KOP 4 and the residence at the western end of Ruble Road, if the property owners are interested in the plantings. The project owner shall submit a landscaping plan to the CPM for review and approval and to the City of Turlock for review and comment. The submittal to the CPM shall include the City's comments. The plan shall include:

a) A detailed list of plants to be used; specifying their rates of growth and times to maturity and their proposed number, size and age at planting;

b) Maintenance procedures for onsite plantings, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project; and

c) A procedure for monitoring for and replacement of unsuccessful onsite plantings for the life of the project.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: The project owner shall submit the landscaping plan prior to commercial operation and at least 90 days prior to installing the landscaping.
If the CPM notifies the project owner that revisions of the submittal are needed, within 30 days of receiving that notification the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscaping that the plantings and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in each Annual Compliance Report.

VIS-6 The project owner shall ensure that the Walnut Energy Center cooling tower is designed and operated so that the plume frequency will not increase from the design as certified.

The cooling tower shall be designed and operated so that the exhaust air flow rate per heat rejection rate (1) will not be less than 15.0 kilograms per second per megawatt when the ambient temperatures are at or less than 46 degrees F; and (2) will not be less than 19.0 kilograms per second per megawatt when the ambient temperatures are greater than 46 degrees F and less than 80 degrees F.

Verification: At least 30 days prior to ordering the cooling towers, the project owner shall provide to the CPM for review the final design specifications of the cooling tower related to plume formation. The project owner shall not order the cooling tower until notified by the CPM that the two design requirements above have been satisfied.

The project owner shall provide a written certification in each Annual Compliance Report, to include cooling tower operation recording data, to demonstrate that the cooling towers have consistently been operated within the above-specified design parameters. If determined to be necessary to ensure operational compliance, based on legitimate complaints received or other physical evidence of potential non-compliant operation, the project owner shall monitor the cooling tower operating parameters in a manner and for a period as specified by the CPM. For each period that the cooling tower operation monitoring is required, the project owner shall provide to the CPM the cooling tower operating data within 30 days of the end of the monitoring period. The project owner shall include with this operating data an analysis of compliance and shall provide proposed remedial actions if compliance cannot be demonstrated.

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APPENDIX VR – 1: SUMMARY OF VISUAL RESOURCES ANALYSIS

APPENDIX VR – 2:

VISIBLE PLUME ANALYSIS

William Walters and Lisa Blewitt

INTRODUCTION

The following provides the assessment of Walnut Energy Center (WEC) cooling tower and heat recovery steam generator (HRSG) exhaust stack visible plumes. Staff completed a modeling analysis for the Applicant's proposed unabated cooling tower and HRSG designs.

PROJECT DESCRIPTION

The applicant has proposed a linear five-cell mechanical draft cooling tower. The applicant has not proposed to use any methods to abate visible plumes from the cooling towers.

The project includes two separate turbine/heat recovery steam generator (HRSG) systems, each with separate exhaust stacks. The CTGs are General Electric Frame 7EA type engines. The Applicant has not proposed to use any methods to abate visible plumes from the HRSG exhausts.

The WEC project site will be located four miles west of downtown Turlock in Stanislaus County, southeast of the intersection of West Main Street and South Washington Road. This is a mixed land use area with industry, including the Foster Farm's Foster Commodities-West Main plant located adjacent to the project site, agricultural lands, and low to medium density residential areas.

There are several industrial visible water plume sources in the immediate project area. The visible water plume sources are from primarily agricultural processing, rather than combustion or cooling. Therefore, these plume sources, although not as large as those that may occur from the proposed WEC cooling tower, will likely occur at a higher frequency than the proposed WEC project plume sources, particularly the HRSGs.

COOLING TOWER VISIBLE PLUME MODELING ANALYSIS

COOLING TOWER DESIGN PARAMETERS

The following cooling tower design characteristics, presented below in **Table 1**, were determined through a review of the applicant's AFC (TID 2002a) and Data Response #81 (CH2Mhill 2003c). After receipt of the original data response the applicant was asked if any safety margins should be applied to the design, in the case that staff may seek to require the design to be built as modeled and analyzed. The applicant provided this data in a revised Data Response #81 (CH2Mhill 2003f), which is being used to determine potential visual impacts.

Table 1 – New Cooling Tower Operating and Exhaust Parameters

Parameter		New Cooling Tower Design Parameters	
Number of Cells		5 (1 x 5)	
Stack Height		17.1 meters (56 feet)	
Cell Stack Diameter		11.3 meters (37 feet)	
Equivalent Stack Diameter		22.676 meters/25.353 meters (1)	
Maximum Design Inlet Air Flow Rate (kg/s)		3,280/4,035 (1)	
Design Heat Rejection Rate (MW)		216/210 (1)	
Case (2)	**Ambient Condition**	**Exhaust Flow Rate (lbs/s/cell)**	**Exhaust Temperature (°F)**
1	97 °F, 25.5% RH	1744.9	90.8
2	61 °F, 59% RH	1778.9	81.1
3	32 °F, 89.5% RH	1808.7 (4 cells)	76.7

Source: AFC (TID 2002a) and Data Request Response #81 (CH2Mhill 2003c), revised DRR #81 (CH2Mhill 2003x).
Notes:
(1) Numbers represent 32°F 4 cell operation and 61°F 5 cells operation, and are used as inputs for the SACTI modeling analysis. The applicant indicated that they did not know at what point that the fifth cooling tower cell would be shutdown, but to assume that it is was halfway between 32°F and 61°F.
(2) For CSVP modeling, values were extrapolated or interpolated between data points as necessary. These values were calculated based on the applicant's margined heat rejection rate and air flow rate (CH2Mhill 2003x).

The applicant also provided a fogging frequency curve from Marley Cooling Technologies as part of Data Response #81 (CH2Mhill 2003c, Attachment VIS-83); however, that curve represents the cooling tower design prior to the addition of the design safety margins.

COOLING TOWER VISIBLE PLUME MODELING ANALYSIS

Staff modeled the cooling tower plumes using both the Combustion Stack Visible Plume (CSVP) model and the Seasonal/Annual Cooling Tower Impact (SACTI) model. The SACTI model is designed to model multiple cell cooling towers, and for the CSVP modeling analysis uses an equivalent stack diameter approach in order to model the entire exhaust water emissions of the tower. **Table 2** provides the CSVP model visible plume frequency results using a five-year (1990-1994) meteorological data set, obtained from the National Climatic Data Center, from Fresno.

Table 2 – Staff Predicted Hours with Cooling Tower Steam Plumes Fresno 1990-1994 Meteorological Data

Full Load Operation	Available (hr)	Plume (hr)	Percent
All Hours	43,824	19,738	45.0%
Daylight Hours	22,190	6,329	28.5%
Nighttime Hours	21,634	13,409	62.0%
Daytime No Rain No Fog Hours	18,349	3,419	18.6%
Seasonal Daylight Hours	10,031	5,413	54.0%
Seasonal Daylight No Rain No Fog Hours	6,560	2,662	40.6%

*Seasonal conditions occur anytime from November through April.

These results confirm that the visible plume formation will occur predominately during the cold weather months, with the majority of plume formation occurring at night or morning hours.

For the proposed cooling tower during seasonal daylight no rain no fog hours, the minimum relative humidity where a visible plume is predicted is 21 percent at 46°F when operating with four cooling tower cells. The maximum temperature where a

visible plume is predicted during seasonal daytime no rain no fog hours is 66°F at 76 percent relative humidity.

Staff's SACTI modeling analysis visible plume dimension results, using the same five-year (1990-1994) meteorological data set from Fresno, compared to the CSVP model results are provided in **Table 3**.

Table 3 – Staff Results of Cooling Tower Visible Plume Dimensions Sacramento 1990-1993 Meteorological Data

All Hours	Percentile	SACTI Model	CSVP Model
Length (m)	25%	60-70	218
	10%	300-400	1,331
	5%	400-500	3,112
	1%	2000-3000	>5,000
	Maximum	>10,000	>5,000
Height (m)*	25%	30-40	145
	10%	90-100	221
	5%	100-200	260
	1%	200-300	935
	Maximum	900-1000	>2,000
Width (m)	25%	40-60	77
	10%	80-100	130
	5%	80-100	202
	1%	120-140	747
	Maximum	800-1000	>1,000
Daytime No Rain/Fog Hours			
Length (m)	25%	30-40	No plume
	10%	40-50	52
	5%	200-300	134
	1%	500-600	450
	Maximum	>10,000	>5,000
Height (m)*	25%	20-30	No plume
	10%	30-40	68
	5%	70-80	139
	1%	200-300	431
	Maximum	>1,000	>2,000
Width (m)	25%	20-40	No plume
	10%	40-60	50
	5%	60-80	62
	1%	80-100	100
	Maximum	800-1,000	>1,000
Seasonal Daytime No Rain/Fog Hours			
Length (m)	25%	40-50	45
	10%	200-300	165
	5%	500-600	288
	1%	1,000-2,000	724
	Maximum	>10,000	>5,000
Height (m)*	25%	20-30	61
	10%	70-80	161
	5%	200-300	280
	1%	200-300	779
	Maximum	>1,000	>2,000
Width (m)	25%	40-60	49
	10%	60-80	67
	5%	60-80	82

	1%	100-120	138
	Maximum	800-1,000	>1000

Seasonal = November through April (day 120-304).
*SACTI Plume height does not include the height (17.1meters) of the cooling tower (release point).

CLOUD COVER DATA ANALYSIS METHOD

A plume frequency of 10 percent of seasonal (November through April) daylight no rain/fog high visual contrast (i.e. "clear") hours is used to determine potential plume impact significance. The high visual contrast hours analysis methodology is provided below:

> The Energy Commission staff has identified a "clear" sky category during which plumes have the greatest potential to cause adverse visual impacts. For this project the meteorological data set[3] used in the analysis categorizes total sky cover and opaque sky cover in 10 percent increments. Staff has included in the "Clear" category a) all hours with total sky cover equal to or less than 10 percent plus b) half of the hours with total sky cover 20-100 percent that have sky opacity equal to or less than 50 percent. The rationale for including these two components in this category is as follows: a) plumes typically contrast most with sky under clear conditions and, when total sky cover is equal to or less than 10 percent, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear; and b) for a substantial portion of the time when total sky cover is 20-100 percent and the opacity of sky cover is relatively low (equal to or less than 50 percent), clouds do not substantially reduce contrast with plumes; staff has estimated that approximately half of the hours meeting the latter sky cover and sky opacity criteria can be considered high visual contrast hours and are included in the "clear" sky definition.

If it is determined that the seasonal (November through April) daylight no rain/fog high visual contrast hour plume frequency is greater than 10 percent then plume dimensions are determined and a significance analysis of the plumes is included in the Visual Resources section of the Staff Assessment.

The results of the high visual contrast hours analysis is provided in **Table 4**.

Table 4 – Staff Predicted Cooling Tower Plume Hours Cloud Cover

Plume Hours by Cloud Cover Type					
All		Clear		Scattered/Broken/Overcast	
Hours	%	Hrs	%	Hours	%
2,662	40.6%	1,179	17.9	1,483	22.6

* - Percentiles are calculated by dividing the number of plume hours by the reference number of seasonal daylight no rain no fog hours (6,560).

The "clear" sky plume dimensions are estimated by the CSVP model are as follows:

[3] This analysis uses a Fresno Hourly US Weather Observations (HUSWO) meteorological data set obtained from the National Climatic Data Center (NCDC).

Table 5 – Staff Predicted "Clear" SDNRNF Cooling Tower Plume Dimensions

	Cooling Tower "Clear" Plume Dimensions		
Percentile	Length	Height	Width
1%	544 (1,784)	600 (1,967)	120 (393)
5%	135 (443)	163 (535)	65 (214)
10%	50 (164)	76 (251)	51 (167)
15%	13 (43)	37 (121)	39 (128)

SDNRNF – Seasonal Daylight No Rain No Fog
Data provided in meters and (feet)

HRSG VISIBLE PLUME MODELING ANALYSIS

Staff evaluated the applicant's AFC (TID 2002a, AFC Appendix 8.1A) and performed an independent psychrometric analysis and dispersion modeling analysis. The Combustion Stack Visible Plume (CSVP) model was used to estimate the worst-case potential plume frequency for each HRSG stack.

HRSG PARAMETERS

Based on the stack exhaust parameters anticipated by the applicant for each HRSG stack, the frequency of visual plumes can be estimated. The operating data for these stacks are provided in **Table 6**.

Table 6 – HRSG Exhaust Parameters

Parameter	**HRSG Exhaust Parameters**			
Stack Height	132 feet (40.23 meters)			
Stack Diameter	16.0 feet (4.88 meters)			
Molecular Weight	28.35 lb/lb-mol (assumed for all cases)			
Ambient Conditions	Ambient Relative Humidity (%)	Moisture Content (% by mass)	Exhaust Flow Rate (klb/hr)	Exhaust Temp (°F)
100% Load with Inlet Chilling [a]				
32 °F	90	4.25	2,488.2	215
61 °F	59	4.77	2,369.2	215
97 °F	26	6.21	2,274.0	216
50% Load without Inlet Chilling				
32 °F	90	4.31	1,607.4	165
61 °F	59	4.51	1,553.9	160
97 °F	26	4.67	1,493.8	167

Source: AFC (TID 2002a, Appendix 8.1A Table 8.1A-1) and Electronic Air Quality Modeling Files

For CSVP the analysis, values were extrapolated or interpolated between data points as necessary.
Note(s): a. No inlet chilling at 100% load and 32 °F.

HRSG VISIBLE PLUME MODELING ANALYSIS

Staff modeled the HRSG plumes using the CSVP model with a five-year meteorological data set from Fresno. **Table 7** provides the CSVP model visible plume frequency results.

Table 7 – Staff Predicted Hours with HRSG Steam Plumes
Fresno 1990-1994 Meteorological Data

Case	Available (hr)	100% Load		50% Load	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	43,818	764	1.7%	4,977	11.36%
Daylight Hours	22,190	131	0.6%	1,055	4.75%
Daylight No Rain No Fog	18,349	10	0.1%	150	0.82%
Seasonal Daylight Hours*	10,031	131	1.3%	1,051	10.48%
Seasonal Daylight No Rain No Fog*	6,560	10	0.2%	149	2.27%
Seasonal Daylight Clear*	6,560	10	0.2%	101	1.54%

*Seasonal conditions occur anytime from November through April.

For the proposed HRSGs, the maximum temperature where a visible plume is predicted is 38°F when the relative humidity is 100 percent when operating at 100 percent load and 52°F when the relative humidity is 100 percent when operating at 50 percent load.

A plume frequency of 10 percent of seasonal (November through April) daylight clear hours is used as a plume impact study threshold trigger. The plume frequencies are predicted to be well less than 10 percent of seasonal daylight clear hours.

CONCLUSIONS

Visible plumes from the proposed WEC cooling tower are expected to occur greater than 10 percent of seasonal daylight clear hours. Therefore, an analysis of the project's cooling tower plumes is included in the Visual Resources section.

Visible plumes from the proposed WEC HRSGs are not expected to occur greater than 10 percent of seasonal daylight clear hours. Therefore, the project is not expected to cause significant visual impacts under the expected operating conditions, and no further visual plume impact analysis is necessary to address the impacts from the HRSG plumes.

REFERENCES

CH2Mhill, Sacramento, California (CH2Mhill) 2003c. Data Response, Set 1B. Submitted to the California Energy Commission on February 25, 2003.

CH2Mhill, Sacramento, California (CH2Mhill) 2003f. Data Response, Set 2A. Submitted to the California Energy Commission on April 11, 2003.

Turlock Irrigation District, Turlock, California (TID) 2002a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 19, 2002.

APPENDIX VR – 3

LIGHTING COMPLAINT RESOLUTION FORM

Walnut Energy Center City of Turlock, California
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.)

APPENDIX VR – 4: VISUAL RESOURCES FIGURES

WASTE MANAGEMENT

Ellie Townsend-Hough

INTRODUCTION

This Waste Management analysis examines the issues associated with managing wastes generated from constructing and operating the proposed Turlock Irrigation District (TID) Walnut Energy Center (WEC). Staff evaluated 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. Wastewater is more fully 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 the construction and operation of the proposed project will be managed in an environmentally safe manner; and
- The 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)

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

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

Title 40, Code of Federal Regulations, part 260

These sections contain regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity; 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, registered hazardous waste transporters must only handle hazardous waste. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

Title 22, California Code of Regulations, §67100.1 et seq. (Hazardous Waste Source Reduction and Management Review)

These sections establish reporting requirements for generators of certain hazardous and extremely hazardous wastes in excess of specified limits. The required reports must indicate the generator's waste management plans and performance over the reporting period.

LOCAL

The City of Turlock Municipal Services Department and the Stanislaus County Department of Environmental Resources (DER) have the responsibility for administration and enforcement of the California Integrated Waste Management Act for non-hazardous solid waste at the proposed WEC.

The WEC must also comply with the Stanislaus County Fire Code, which governs the storage and use of hazardous materials and wastes per Fire Code requirements. This Code also requires that the WEC obtain a Hazardous Materials and Waste Storage Permit from the County.

SETTING

PROJECT AND SITE DESCRIPTION

The proposed WEC would be located on 18 acres of a 69–acre parcel of land in the City of Turlock in Stanislaus County. The site is located on the southeast corner of the intersection of West Main Street and South Washington Road. The major components of the proposed WEC project are a 250-megawatt (MW) combined-cycle generating facility configured using two natural-gas-fired combustion turbines, one steam turbine, two heat recovery steam generators, a five-cell mechanical-draft cooling tower, and dry low oxides of nitrogen combustors. TID proposes to construct a 1,950-foot 115 kV transmission line, a 670-foot 69 kV line, and a 3.6-mile eight-inch natural gas pipeline. The City of Turlock's Wastewater Treatment Plant would supply the proposed project with recycled water to be used for cooling tower make-up. A new 1.6-mile wastewater pipeline and a 0.9-mile portable water pipeline would also be required for the project (TID 2002a, Section 2.0).

The 69-acre site is located on industrial property currently being used for agricultural purposes. Foster Farms owns the property and uses part of the parcel to store rice hulls and sawdust for chicken bedding. The property is also leased to Ken Collins, who has farmed the site for 15 years. He has grown oats, corn and alfalfa on the property. Prior to the 1970s, the property was used as a dairy farm.

The ENSR Corporation performed Phase I and Phase II Environmental Site Assessments (ESA) according to the American Society for Testing and Materials (ASTM) Standard E 1527. The Phase I ESA was completed in September, 2002. ENSR reviewed the published state and regulatory databases and lists to determine if the project site had past or present records of potential environmental impact or was under investigation for causing environmental impact. The project site was not listed on any of the state or federal lists. ENSR also interviewed the local agencies and found no records or files indicating environmental impact (TID 2002a, Appendix 8.13A). ENSR recommended obtaining soil samples at the proposed project site and testing for organochlorine pesticides and metals because the land was, and is, used for agriculture.

In the Phase II ESA, ENSR collected 20 soil samples and combined them to make five composite samples. The samples were analyzed for organochlorine pesticides and metals. The laboratory analytical results indicate the site has not been impacted because of agricultural land use. Metals were found in the results, but the concentrations were below the USEPA Region 9 Preliminary Remediation Goals for industrial use (TID 2002a, Appendix 8.13B). Although pesticides were not detected in any soil samples (Id.), the laboratory detection limits were not provided.

IMPACTS

PROJECT SPECIFIC IMPACTS

Construction

Site preparation and construction of the proposed generating plant and associated facilities would generate both nonhazardous and hazardous wastes in solid and liquid forms.

Nonhazardous Solid Wastes

Nonhazardous solid wastes anticipated to be generated during construction are detailed in Section 8.13.4.1.1 of the AFC (TID 2002a). Approximately 60 tons of wood, paper, glass and plastics, 40 tons of excess concrete, and 15 tons of scrap metal could be generated during project construction. Wherever possible and practical, these wastes would be recycled, particularly the paper products and metals. Nonrecyclable wastes would be collected and disposed of in a Class III landfill. A possible exception might include the disposal of the waste concrete in a clean fill site, if one is available.

Drilling would be necessary to install the natural gas and water pipelines. Three hundred tons of drilling mud, which consists of nontoxic bentonite clay, would be used to lubricate and cool the drilling bit. The drilling mud would be tested before disposal at a Class II or III landfill (TID 2002a p. 8.13-5).

Hazardous Wastes

Hazardous wastes anticipated to be generated during construction are discussed in Section 8.13.4.1.3 of the AFC (TID 2002a). Solid hazardous wastes may include spent welding materials and dried paint. Liquid hazardous wastes would include waste solvents along with flushing, cleaning and passivating (nitrate or phosphate solution) fluids. Minimal quantities of the solid wastes and solvents are anticipated. The liquid flushing, cleaning and passivating wastes would be generated in quantities estimated at one to two times the internal volumes of the pipes being cleaned (TID 2002a, p. 8.13-6).

The construction contractor would be considered the generator of hazardous wastes at this site during the construction period and would be responsible for proper waste handling, storage, disposal, record keeping, and employee training. Solid hazardous wastes along with liquid wastes (except for the flushing wastes referred to above which will be temporarily stored on-site in portable tanks and disposed off-site) would be accumulated at satellite locations and then transported daily to the 90-day storage area located at the site construction laydown area. The wastes thus accumulated would be removed from the site and transported by a certified collection company to a permitted transfer, storage and disposal (TSD) facility prior to the expiration of the 90-day limit (TID 2002a, p. 8.13-6).

Operation

The proposed WEC would generate both nonhazardous and hazardous wastes in solid and liquid forms under normal operating conditions.

Nonhazardous Solid Wastes

Nonhazardous solid wastes generated during plant operation are expected to include rags, turbine air filters, machine parts, electrical materials, empty containers, and typical worker and small office wastes. Approximately 50 cubic yards of these wastes would be generated annually. Large metal parts would be recycled (TID 2002a, p. 8.13-6).

Zero Liquid Discharge System

In order to reduce and reuse wastewater in the plant, TID proposes to implement a zero-liquid discharge (ZLD) system for the proposed WEC (TID 2002a, pp. 2-12, 2-13, 8.13-6). The ZLD system would include a brine concentrator system, crystallizer system, and associated equipment such as tanks and pumps.

The ZLD system would be designed to process all of the wastewater produced by the plant's primary wastewater system, returning a relatively high quality distillate stream for reuse in the plant and producing a solid waste stream (salt cake). Wastewater would be processed in two steps. The first would be a brine concentrator, which would concentrate the wastewater to produce a clean distillate stream. The second step would further process the remaining wastewater, producing another clean distillate stream and the salt cake.

The operation of the ZLD system would result in a generation of approximately eight tons per day of salt cake waste (TID 2002a, p. 8.13-6). This would require disposal of about 2,830 tons per year of salt cake waste (TID 2002a, p.8.13-8). Testing was done for similar ZLD systems in support of the Three Mountain Project and Pastoria Energy Facility siting cases in order to determine if the wastes might be classified as hazardous. Analyses of the solid wastes similar to those that would be generated from the softener, as well as the crystallizer, indicated that all metals of concern were below California regulatory limits that define hazardous waste. In order to ensure the correct classification of such wastes from the proposed project, however, staff proposes Condition of Certification **WASTE-6**, which would require testing of the salt cake.

Although the solid waste generated from the crystallizer may not be classified as hazardous, it might be considered a California designated waste due to its high salt content. The category of designated waste includes nonhazardous waste that contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations that could exceed applicable water quality objectives or affect the beneficial uses of waters of the state (Cal. Code Regs., tit. 27, § 20210). Designated wastes are required to be disposed of at Class I or Class II disposal sites.

The effluent from the brine concentrator would be piped to the crystallizer for further concentration as typically done in ZLD systems. Secondary materials (such as the effluent) that are reclaimed and returned in a closed system to the original process in which they were generated where they are reused (in this case, as plant process water) are exempt from management as hazardous wastes (Cal. Code Regs., tit. 22, § 66261.4(a)(5)(A)). Thus, because the effluent would be recycled in a closed system, it would not require hazardous waste testing nor would a permit be required from DTSC.

Construction and operation of the zero liquid discharge system would not have any significant effects on any of the other waste streams generated at WEC.

Hazardous Wastes

Hazardous wastes anticipated to be generated during routine project operation include waste lubricating oil, used oil filters, laboratory waste, selective catalytic reduction (SCR) and oxidation catalysts, oily rags and absorbents, and used acidic and alkaline chemical cleaning wastes (potentially containing high concentrations of heavy metals). Table 8.13-4.2.3 in the AFC (TID 2002a) lists the anticipated hazardous wastes (except the cleaning solutions) along with their origin, composition, estimated quantity, hazard class, and disposal method. Most of the wastes would be generated in relatively small quantities and would be recycled by certified recyclers. For example, all the oil and oil-contaminated wastes would total approximately 1,250 pounds per year, and all would be recycled. The emission control catalysts would require regeneration every three to five years resulting in the generation of a total of 1,200 pounds of waste material. The SCR generated portions of that total (600 pounds) could require disposal in a Class I facility if recycling / regeneration proves not to be feasible. Chemical materials collected in drains as a result of spillage, overflows, and maintenance operations will be neutralized onsite (if necessary) and directed into the cooling tower basin. Four hundred gallons per year of sulfuric acid will be used in water treatment. In addition, Table 8.13-2 of the AFC (TID 2002a) notes that up to 100 pounds per year of cooling tower sludge will normally require disposal in a Class II facility, but could sometimes require disposal as a hazardous waste.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

Nonhazadous waste disposal sites suitable for discarding project-related construction and operation wastes are identified in Section 8.13.4 of the AFC (TID 2002a). During construction of the proposed project, 415 tons of nonhazardous wastes would be generated. This would consist of 60 tons of paper, woods, and plastic; 40 tons of concrete; 15 tons of metal; and 300 tons of drilling mud. The nonhazardous solid wastes generated yearly at the WEC would be recycled if possible, or disposed of in a Class III landfill. Fifty cubic yards per year of miscellaneous wastes are projected to be generated throughout operation of the plant. During operation, another eight tons per day (2,830 tons per year) of salt cake would also be generated and require disposal at a Class I or II landfill, depending upon the results of toxicity testing.

Section 8.13.5 (TID 2002a) notes that there are four garbage collection services available for removal of solid waste from the proposed project site: Turlock Scavenger Company, Bertoletti Disposal Service, Gilton Solid Waste Management, and Waste Management (TID 2002a, Section 8.13.5.1). **Waste Management Table 1** lists the specifics of the landfills closest to the proposed project. Thus, the total amount of nonhazardous waste generated from project construction and operation will contribute only a fraction of one percent of available landfill capacity. Staff finds that disposal of the solid wastes generated by the WEC can occur without significantly impacting the capacity or remaining life of any of these facilities.

There are three Class I landfills in California: the Buttonwillow Landfill in Kern County and Westmorland Landfill in Imperial County (both owned by Clean Harbors), and the

Kettleman Hills Landfill in Kings County (owned by Waste Management). Together, the two Clean Harbors facilities and the Kettleman Hills facility possess an excess of 17.1 million cubic yards of remaining hazardous waste disposal capacity, with remaining operating lifetimes up to the year 2050. Section 8.13.5.2 of the AFC indicates that of the 250 RCRA TSD facilities in California listed by the U. S. EPA, the closest to the proposed WEC project is the Kettleman Hills facility located in Kings County, and notes the existence of other offsite hazardous waste treatment and recycling facilities in California capable of handling various portions of the facility's hazardous waste. It is estimated that 2,830 tons per year of salt cake will be generated during operation of the ZLD. Thus, even if the salt cake were to be placed in a Class I facility, no significant impact on waste disposal facilities would occur.

WASTE MANAGEMENT TABLE 1
Solid Waste Disposal Facilities for WEC Waste

Landfill	SWIS NO.*	Class	Permitted Capacity	Estimated Closure Date
Fink Road		II, III	2,400 yd^3/day	2011
Forward Inc	39-AA-0015	I, II, III	15.9 million yd^3	2006
Austin Road/Forward	39-AA-0001	III	18.2 million yd^3	2053
Highway 59 Disposal Site	24-AA-001	III	30 million yd^3	2030

*California Integrated Solid Waste Management Board Solid Waste Information System (SWIS)

MITIGATION

In section 8.13.6 of the AFC (TID 2002a), the applicant states that the handling and management of wastes at the proposed WEC facility would follow the hierarchical approach described in the following order of preference from greatest to least:

1. source reduction through pollution prevention measures;
2. recycling or reusing waste materials;
3. treatment to render the waste nonhazardous such as through neutralization; and
4. disposal of only those wastes that cannot be reduced treated or recycled.

Sections 8.13.6.1 and .2 of the AFC (TID 2002a) discuss waste management measures WEC would employ during the construction and operation phases to manage and mitigate the impacts of the generation of liquid and solid non-hazardous and hazardous wastes.

Staff has proposed Conditions of Certification **WASTE-1, 2, 3, 4, and 5** which require that: 1) the project owner have an experienced Registered Professional Engineer or Geologist available for consultation during soil excavation and grading activities in the

event that contaminated soils are encountered; 2) if potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling, file a written report, and seek guidance from the Compliance Project Manager (CPM) and the appropriate regulatory agencies; 3) the project owner obtain a unique hazardous waste generator identification number from the Department of Toxic Substances Control (DTSC) in accordance with DTSC regulatory authority; 4) the project owner notify the CPM whenever the owner becomes aware of any impending waste management-related enforcement action; and 5) the project owner prepare and submit waste management plans for all wastes generated during construction and operation of the facility and submit them to the CPM and the local agency.

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

Energy Commission staff concludes that the proposed WEC would be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during facility construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by DTSC or Regional Water Quality Control Boards. Because hazardous wastes would be generated during project construction and operation, both the WEC and its construction contractor would be required to obtain hazardous waste generator identification numbers from the DTSC. Accordingly, both WEC and its construction contractor would be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, keep detailed records and appropriately train their employees. Pursuant to California Code of Regulations, Title 22, section 67100.1 et seq., a hazardous waste Source Reduction and Evaluation Review and Plan may be required to be prepared by the WEC.

CUMULATIVE IMPACTS

As proposed, the quantities of nonhazardous and hazardous wastes generated during construction and operation of the WEC project would add to the total quantities of waste generated in Stanislaus County and the State of California. However, because (a) the waste would be generated in small quantities, (b) recycling efforts would be prioritized wherever practical, and (c) capacity is available in a variety of disposal facilities, these added quantities would not result in significant waste management impacts to any hazardous or nonhazardous landfill.

This facility would generate an estimated 415 tons of solid waste during construction and 2,965 tons per year during operation (including about three tons of hazardous waste). For comparative purposes, the Integrated Waste Management Board's Jurisdiction Disposal and Average Daily Capacity (ADC) web pages list the amount of solid waste disposed of in Stanislaus County in the year 2000 as 114,134.62 tons. WEC's contribution will represent approximately three percent of total county waste generation (CIWMB 2003). The amount of solid waste anticipated to be generated by the proposed facility constitutes an insignificant increase to this total.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed WEC power plant (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff considers these to be pockets or clusters. Staff also reviewed Census 2000 information that shows the low-income population is less than fifty percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for **Waste Management**.

Since staff has concluded that there would be no significant direct or cumulative waste-related impacts resulting from construction and operation of the proposed facility, there will also be no significant impact to any minority populations that are identified. Therefore, there are no environmental justice issues.

FACILITY CLOSURE

Section 8.13.6.3 of the AFC (TID 2002a) discusses WEC's responsibilities for waste management in the event of a temporary facility closure due to a disruption in the supply of natural-gas fuel or damage to the facility due to a natural disaster; or permanent closure due to a cessation of operations. The applicant indicates that a contingency plan for temporary closure will be prepared prior to facility startup. In addition, a Risk Management Plan (AFC Section 8.12.8.4) will be established containing additional procedures to be followed in the event of temporary closure due to plant damage or the possible release of a hazardous waste or material into the environment.

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 would 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 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, WEC would develop a facility General Closure Plan at least twelve months prior to commencement of closure and is committed to complying with LORS that are applicable at the time of closure. The applicant indicates (see AFC Section 8.13.6.3.2) that such a closure plan would emphasize the maximum recycling of facility components and 24-hour site security.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

AGENCY COMMENTS

The Department of Toxic Substances Control (DTSC) reviewed the AFC and submitted comments to the Commission (DTSC 2003). The agency restated that a permit would be required for hazardous wastes treated, stored or disposed of on-site for more than 90 days.

DTSC also reviewed the Phase I ESA as well as the limited soil sampling conducted for the Phase II ESA and recommended that the applicant conduct "…chlorinated herbicide analysis on surface soil samples limited within the 18-acre plant site footprint of the 69-acre property site" (DTSC 2003). DTSC was concerned that the pesticide analytical results shown as "not detected" in Table 1 of the Phase II ESA may not accurately represent current conditions considering the property has been in agricultural land use for over 30 years, and noted that "DTSC staff has identified the presence of chlorinated herbicides at other properties where agricultural activities have been conducted on a long term basis."

Staff requested that the applicant provide sufficient data to allow determination of the presence or absence of organochlorine pesticides. On April 30, 2003, the applicant submitted additional data on organochlorine pesticide detection limits from the project site and a comparison of those results to U. S. EPA preliminary remediation goals (PRGs). The data was submitted to DTSC on May 1, 2003. DTSC confirmed that the detection levels of the organochlorine pesticides were well below the U.S. EPA PRGS, meaning that the levels are below those of regulatory concern.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that the applicant's waste management plan for the proposed WEC would allow for compliance with LORS designed to minimize the potential for human health and environmental effects and would not cause a significant direct, or indirect, cumulative adverse impact.

To ensure implementation of all necessary mitigation measures, staff recommends adoption of the conditions of certification listed below.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall provide the resume of a Registered Professional Engineer or Geologist, who shall be available for consultation during

soil excavation and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of site mobilization the project owner shall submit the resume to the CPM.

WASTE-2 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the Regional Water Quality Control Board (as appropriate), the County of Stanislaus Department of Environmental Resources, and the Sacramento Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any final reports filed by the Registered Professional Engineer or Geologist to the CPM within five days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-3 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall keep its copy of the identification number on file at the project site and notify the CPM via the Monthly Compliance Report of its receipt.

WASTE-4 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-5 The project owner shall prepare a Construction Waste Management Plan and an Operation Waste Management Plan for all wastes generated during

construction and operation of the facility, respectively, and shall submit both plans to the CPM for review and approval. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste stream, 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.
- The construction plan shall contain a description of hazardous waste identification training for workers who are involved in earthmoving activities.

Verification: No less than 30 days prior to the start of site mobilization, the project owner shall submit the Construction Waste Management Plan to the CPM.

The operation waste management plan shall be submitted no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM.

In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to the planned management methods.

WASTE-6 The project owner shall test the salt cake product from the crystallizer for the presence of hazardous levels of metals. If levels are below ten times the Soluble Threshold Level Concentration as listed in Title 22, California Code of Regulations, section 66261.24, then future testing is not required unless there is a substantial change in the wastewater treatment process. If not classified as a hazardous waste, the project owner shall manage the salt cake product appropriately as a nonhazardous or designated waste unless it is sold as a commercial product.

Verification: No later than 30 days after the initial generation of salt cake, the project owner shall notify the CPM of the test results and the planned disposal method.

REFERENCES

California Integrated Waste Management Board (CIWMB 2003). Juridiction Disposal and ADC Webpage, http://www.ciwmb.ca.gov/lgtools/DRS/JurDspFa.asp, April 2003.

CH2MHILL. 2003. Email from Karen Parker to Ellen Townsend-Hough, California Energy Commission. Organochlorine Pesticide Dectection Limits Compared to U. S. Environmental Protection Agency Preliminary Remediation Goals, April 30, 2003.

Department of Toxic Substances Control (DTSC). 2003. Letter from Richard Hume to Robert Eller, California Energy Commission, April 4.

Turlock Irrigation District, Turlock, California (TID) 2002a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 19, 2002.

WORKER SAFETY AND FIRE PROTECTION

Geoff Lesh and Rick Tyler

INTRODUCTION

Worker safety and fire protection are 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 that 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 whether the worker safety and fire protection measures proposed by Turlock Irrigation District (applicant) for the Walnut Energy Center (WEC) are adequate measures to:

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

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 (OSA Act). This Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § section 651 (29 U.S.C. §§ 651 through 678). Implementing regulations are codified at Title 29 of the Code of Federal Regulations, under General Industry Standards §§ 1910.1 - 1910.1500 and clearly define 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 general industry safety and health standards now in force under this OSH Act represent a compilation of materials 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 purpose of the Occupational Safety and Health 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 U.S.C. § 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 OSH Act.

Applicable federal requirements include:

- Occupational Safety and Health Act of 1970 29 U.S.C. § 651 et seq.;
- Occupational Safety and Health Administration Safety and Health Regulations 29 C.F.R. §1910.1 - 1910.1500; and
- 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 C.F.R. §§ 1910.1 – 1910.1500 and §§ 1952.170 – 1952.175.

STATE

California passed the Occupational Safety and Health Act of 1973 ("Cal/OSHA") as codified in the California Labor Code § 6300 et seq. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with sections 337-560 and continuing with sections 1514 through 8568. The California Labor Code requires that the Cal/OSHA Standards Board adopt standards at least as effective as the federal standards (Labor Code § 142.3(a)). Thus all Cal/OSHA health and safety standards meet or exceed the federal requirements. California obtained federal approval of its state health and safety regulations, in lieu of the federal requirements which are codified at 29 CFR §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.

Employers are responsible for informing their employees about workplace hazards, potential exposure and the work environment (Labor Code § 6408). Cal/OSHA's principal tool in ensuring that workers and the public are informed is the Hazard Communication standard first adopted in 1981 Cal. Code Regs., tit. 8, §5194. This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1980. It was later revised to mirror the Federal Hazard Communication Standard (29 C.F.R. §1910.1200) which established on the federal level an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers. A major component of this regulation is the required provision of Material Safety Data Sheets (MSDSs) to workers. MSDSs provide information on the identity, toxicity, and precautions to take when using or handling hazardous materials in the workplace.

Finally, California Code of Regulations, title 8 section 3203 requires that employers establish and maintain a written Injury and Illness Prevention Program to identify workplace hazards and communicate them to their employees through a formal employee-training program.

Applicable state requirements include:

- Cal. Code Regs., tit. 8, §339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act;
- Cal. Code Regs., tit. 8, §337, et seq. Cal/OSHA regulations;

- Cal. Code Regs., tit. 24, § 3 et seq. - incorporates the current edition of the Uniform Building Code;
- Health and Safety Code § 25500 et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility; and
- Health and Safety Code §§ 25500 - 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 section 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 Cal. Code Regs., 24 (Health and Safety Code §18901 et seq.) pertaining to the California Fire Code.

Similarly, the Uniform Fire Code (UFC) 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. The latest revision of the Uniform Fire Code, adopted into the Stanislaus County Fire Code, is the 2000 version.

Applicable local (or locally enforced) requirements include:

- 2001 Edition of California Fire Code and all applicable NFPA standards (Title 24, California Code of Regulations, sections 901-907);
- California Building Code Title 24, California Code of Regulations, section 3 et seq.
- Uniform Fire Code, 2000.

SETTING

The proposed project is to be located in an industrially-zoned area about four miles west of the downtown portion of the City of Turlock, in Stanislaus County, near the intersection of West Main Street and Washington Road. The project site is level, at an elevation of approximately 85 feet above sea level. Essentially flat terrain extends for many miles on all sides of the project site. Some tall industrial structures, consistent with mixed industrial, agricultural, and residential uses including power transmission

facilities, are located in the surrounding area within one mile of the project. The land uses surrounding the proposed facility consist of mixed agriculture, and low-density rural residences. Hazardous materials usage and transportation are commonly associated with the industrial/agricultural activities in the area.

Fire support services to the site will be under the jurisdiction of City of Turlock Fire Department. Staff contacted the Turlock Fire Department (TFD) and determined that the response times to the project site are estimated to be between four and seven minutes (TFD 2003). The closest Turlock Fire Station to the site is Station No. 2 located at 791 S. Walnut St, Turlock, 1.8 miles away with an estimated response time of four minutes. The next closest station is No. 4 located at 2820 N. Walnut St, Turlock, 5.3 miles away, with an estimated response time of eight minutes. The third closest station is No. 1 located at 271 Minaret Road, Turlock, 3.7 miles away, having a response time estimate of 12 minutes. Turlock Fire Department has 62 (33 full time) fire fighters, with 11 personnel on-shift at any given time.

The Turlock Fire Department maintains a Hazardous Materials Response Team, whose members are certified by the State of California as Hazardous Materials Technicians or Specialists. Typically, when a hazardous materials incident occurs, the first arriving engine company will isolate the area, then request the Hazardous Materials Team to respond to their location. The Hazardous Materials Team will take necessary steps to identify the material and mitigate the emergency. For any hazardous material incident in which the Turlock Fire Department might need assistance, the Stanislaus Rural Fire Department would respond with a team and hazmat vehicle coming from the City of Modesto, CA, 12 miles from the WEC facility, with an estimated response time of 20 minutes.

When contacted by staff, the TFD fire chief stated these response times are considered adequate, and that adverse effects on the staff of the TFD are not expected due to the construction of the WEC (TFD 2003).

IMPACTS

PROJECT SPECIFIC IMPACTS

Industrial environments are potentially dangerous, during both construction and operation of facilities. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the WEC to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards.

During construction and operation of the proposed WEC there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural

gas or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS will be adequate to assure protection from all fire hazards.

CUMULATIVE IMPACTS

The Energy Commission staff reviewed the potential for the construction and operation of the WEC, combined with existing industrial facilities, to result in impacts on the fire and emergency service capabilities of the City of Turlock Fire Department. The TFD states that it has adequate resources to respond to a potential emergency at WEC. Staff's experience regarding emergency response incidents at licensed power plants indicates that it is unlikely that there will be more than one such event. Thus, staff found that cumulative impacts due to construction and operation of WEC would be insignificant. No request for additional equipment, staffing, or funding has been made by local authorities (TFD 2003).

APPLICANT'S PROPOSED 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 WEC Workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at California Code of Regulations, title 8, section 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 (Cal Code Regs., tit. 8, § 1509);
- Construction Fire Protection and Prevention Plan (Cal Code Regs., tit. 8, § 1920); and
- Personal Protective Equipment Program (Cal Code Regs., tit. 8, §§ 1514 - 1522).

Additional programs under General Industry Safety Orders (Cal Code Regs., tit. 8, §§ 3200 - 6184), Electrical Safety Orders (Cal Code Regs., tit. 8, §§2299 - 2974) and Unfired Pressure Vessel Safety Orders (Cal Code Regs., tit. 8, §§ 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; and
- Pressure Vessel and Pipeline Safety Program.

The AFC includes adequate outlines of each of the above programs. Prior to construction of the WEC, detailed programs and plans will be provided pursuant to Condition of Certification **WORKER SAFETY-1**.

OPERATIONS AND MAINTENANCE SAFETY AND HEALTH PROGRAM

Upon completion of construction and prior to start of operation at the WEC, the Operations and Maintenance Safety and Health Program will be prepared. This operational safety program will include the following programs and plans:

- Injury and Illness Prevention Program (Cal Code Regs., tit. 8,§ 3203);
- Emergency Action Plan (Cal Code Regs., tit. 8,§ 3220);
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (Cal Code Regs., tit. 8, § 3221); and
- Personal Protective Equipment Program (Cal Code Regs., tit. 8, §§ 3401-3411).

In addition, the requirements under General Industry Safety Orders (Cal Code Regs., tit. 8, §§ 3200 - 6184), Electrical Safety Orders (Cal Code Regs., tit. 8, §§2299 - 2974) and Unfired Pressure Vessel Safety Orders (Cal Code Regs., tit. 8, §§ 450 - 544) will be applicable to the project. Written safety programs, which the applicant will develop for the WEC, will ensure compliance with the above-mentioned requirements.

The AFC includes adequate outlines of the Construction and Operation Health and Safety Programs as well as the Emergency Action Program/Plan, the Construction and Operation Injury and Illness Prevention Programs and the Fire Protection and Prevention Programs (WEC 2002, AFC Sections 8.7.3 -- 8.7.4.4). Prior to operation of the Walnut Energy Center project, all detailed programs and plans will be provided pursuant to Condition of Certification **WORKER SAFETY-2**.

SAFETY AND HEALTH PROGRAM ELEMENTS

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

Injury and Illness Prevention Program (IIPP)

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

The IIPP will include the following components as presented in the AFC:

- identity of person(s) with authority and responsibility for implementing the program;
- system ensuring employees comply with safe and healthy work practices;
- system facilitating employer-employee communications;
- procedures identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- methods for correcting unhealthy/unsafe conditions in a timely manner;
- methods of documenting inspections and training and for maintaining records; and

A training program for:

- introducing the program;
- new, transferred, or promoted employees;
- new processes and equipment;
- supervisors; and
- contractors.

Emergency Action Plan

California regulations require an Emergency Action Plan (Cal Code Regs., tit. 8, § 3220). The AFC contains a satisfactory outline for an emergency action plan (WEC 2002, AFC Sections 8.7.4.3.1 and 8.7.4.3.2).

The outline lists the following features:

- purpose and scope of emergency action plan;
- personnel responsibilities during emergencies;

- specific response procedures;
- evacuation plan;
- emergency equipment locations;
- fire extinguisher locations;
- site security;
- accident reporting and investigation;
- lockout/tagout;
- hazard communication;
- spill containment and reporting;
- first aid and medical response;
- respiratory protection;
- personal protective equipment;
- sanitation; and
- work site inspections.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (Cal Code Regs., tit. 8, § 3221). The AFC describes a proposed fire prevention plan which is acceptable to staff. The plan will include the following topics:

- responsibilities of employees and management;
- procedures for fire control;
- fixed and portable fire-fighting equipment;
- housekeeping;
- employee alarm/communication practices;
- servicing and refueling areas;
- training; and
- flammable and combustible liquid storage.

Staff proposes that the owner/applicant submit a final Fire Protection and Prevention Plan to the California Energy Commission Compliance Project Manager (CPM) and the City of Turlock Fire Department for review and comment to satisfy proposed Conditions of Certification **WORKER SAFETY-1** and **2**.

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies 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 (Cal Code Regs., tit. 8, § 3380-3400). The Walnut Energy Center project operational environment will require the availability of PPE.

Information provided in the AFC indicates that all employees required to use PPE will be checked for proper fit and to see if they are medically capable of wearing the equipment. All safety equipment will meet NIOSH or ANSI standards and will carry markings, numbers, or certificates of approval. Respirators will meet NIOSH and California Department of Health and Human Services Standards. Each employee will be provided with the following information pertaining to the protective clothing and equipment:

- proper use, maintenance, and storage;
- when the protective clothing and equipment are to be used;
- benefits and limitations; and
- when and how the protective clothing and equipment are to be replaced.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provides employees with the information and training necessary to implement the program.

Operations and Maintenance Written Safety Program

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices." Both the Construction and the Operations Safety Programs will address safe work practices under a variety of programs. The components of these programs include the following:

- Fall Protection Program;
- Hot Work Safety Program;
- Confined Space Entry;
- Hearing Conservation Program;
- Hazard Communication Program;
- Process Safety Management (PSM) Program; and
- Contractor Safety Program.

Operations and Maintenance Safety Training Programs

Employees will be trained in the safe work practices described in the above-referenced safety programs.

FIRE PROTECTION

Staff reviewed the information regarding available fire protection services and equipment (WEC 2002, AFC Sections 2.2.12 Fire Protection and 8.7 Worker Health and Safety) to determine if the project would adequately protect workers and if it would affect the fire protection services in the area. Staff agrees with the applicant that the

project should rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services including trained firefighters and equipment for a sustained response would be required by the City of Turlock Fire Department.

The applicant intends to meet the minimum fire protection and suppression requirements as mandated by the Stanislaus County Fire Code, NFPA Standards, and the UFC. Elements include both fixed and portable fire extinguishing systems. The onsite service/fire water storage tank, with a dedicated firewater storage volume of 240,000 gallons, will provide a backup supply of fire protection water. Water for use as fire water will be supplied by the City of Turlock potable water system.

An onsite electric jockey pump and electric-motor-driven main fire pump will be provided to increase the water pressure in the plant fire mains to the level required to serve all fire fighting systems. Additionally, a diesel engine-driven fire pump will be provided to pressurize the fire loop if the power supply to the main fire pump fails. A fire pump controller will be provided for the fire pumps.

All three fire pumps will discharge to a dedicated underground fire water loop piping system. Normally, the jockey pump will maintain pressure in the fire water loop. Both the fire hydrants and the fixed suppression systems will be supplied from the firewater loop.

Fixed fire suppression systems will be installed at determined fire risk areas such as the transformers and turbine lube oil equipment. Sprinkler systems will also be installed in the Administration/Control/Warehouse/Maintenance Building and fire pump enclosure as required by NFPA and local code requirements. The CTG units will be protected by a CO_2 fire protection system. Fire detection sensors will also be installed.

In addition to the fixed fire protection system, fire extinguishers will be located throughout the facility in accordance with NFPA 10.

Prior to construction and operation of the project, the project owner will be required to provide the final Fire Protection and Prevention Program to the City of Turlock Fire Department for review and comment, and to the CPM for approval of the adequacy of the fire protection measures, prior to construction and operation of the project.

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. A facility closure plan will be developed prior to closure to incorporate these requirements.

CONCLUSION AND RECOMMENDATIONS

If the project owner for the proposed Walnut Energy Center project provides a Project Construction Injury and Illness Prevention Program and a Project Operations Safety and

Health Program as required by conditions of certification **WORKER SAFETY-1** and **2**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable LORS. Staff also concludes that the proposed plant will not have significant impacts on local fire protection services. The proposed facility is located within an area that is currently served by the local fire department. The fire risks of the proposed facility do not pose significant added demands on local fire protection services.

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 Construction Injury and Illness Prevention Program and the Operations Safety and Health Program proposed by the applicant 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:

1. A Construction Injury and Illness Prevention Program
2. A Construction Fire Protection and Prevention Plan
3. A Personal Protective Equipment Program

- 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, if appropriate, 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 CPM for review and approval and to the City of Turlock Fire Department.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program, the Personal Protective Equipment Program and the Construction Fire Protection and Prevention Plan, including a copy of the cover letter transmitting the Programs to Cal/OSHA's Consultation Service, if appropriate.

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

1. Operation Injury and Illness Prevention Program
2. Emergency Action Plan
3. Operation Fire Protection Program
4. Personal Protective Equipment Program

- The Operation Injury and Illness Prevention Program, 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, as appropriate, for review and comment concerning compliance of the program with all applicable Safety Orders.

- The Operation Fire Protection Program and the Emergency Action Plan shall be submitted to the fire protection agency serving the project for review and comment.

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. The document shall incorporate Cal/OSHA's Consultation Service comments, if any, regarding its review and acceptance of 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, including all records and files on accidents and incidents, is present onsite.

REFERENCES

1998 California Fire Code. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, Ca.

2001 Uniform Fire Code, Vol. 1. Published by the International Fire Code Institute comprised of the International Conference of Building Officials and the Western Fire Chiefs Association, Whittier, Ca.

City of Turlock Fire Department (TFD). 2003. Personal communication with Fire Chief Mark Langley, April 09, 2003.

WEC (Walnut Energy Center) 2002. Application for Certification, Volume 1 & 2, Walnut Energy Center (02-AFC-4). Dated November 18, 2002 and docketed November 19, 2002.

ENGINEERING ASSESSMENT

FACILITY DESIGN

Shahab Khoshmashrab, Al McCuen and Steve Baker

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- determine 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; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the intent of the engineering LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the Energy 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 discussed in this analysis include:

- Identification of the engineering LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

SETTING

Turlock Irrigation District (TID) proposes to construct and operate a nominally rated 250 megawatt combined-cycle power plant known as the Walnut Energy Center (WEC). The project will be located at the western edge of Turlock, Stanislaus County. The site will occupy approximately 18 acres and will lie in seismic zone 3. For more information on the site and related project description, please see the **Project Description** section of this document. References to "the City" and "the County" designate the City of Turlock and Stanislaus County, respectively. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices 10A through 10G (TID 2002a).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (TID 2002a, Appendices 10A through 10G). Some of these LORS include the California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), and guidelines promulgated by the American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM) and American Welding Society (AWS).

ANALYSIS

The basis of this analysis is the applicant's analysis and proposed construction methods and list of engineering LORS and design criteria set forth in the AFC.

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 Appendices 10A through 10G for a representative list of applicable industry standards), design practices and construction methods in preparing and developing the site. Staff concludes that the project, including its linear facilities, would most likely comply with all applicable site preparation LORS, and proposes Conditions of Certification (see below and the **Geology and Paleontology** section of this document) 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, that require a long lead time to repair or replace, or that are used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable engineering LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects public health and safety.

The project shall be designed and constructed to the 2001 edition of the California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect at the time design and construction of the project actually commences. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 2001 CBSC is in effect, the 2001 CBSC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included 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.

PROJECT QUALITY PROCEDURES

The AFC (TID 2002a, § 2.4.5) describes a project Quality Program that will be used to ensure that systems and components will be designed, fabricated, stored, transported, installed and tested in accordance with the technical codes and standards appropriate for a power plant. 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 would ensure that the project is actually designed, procured, fabricated, and installed as contemplated in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the CBO 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 CBO 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 to 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 delegates typically include the local building official and/or 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 will invite the local building authority, either the City or the County, or a third party engineering consultant, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed Conditions of Certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant'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 subject to CBO review and approval shall 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 in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities subject to CBO review and approval, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. Those elements of construction that are not difficult to reverse are allowed to proceed without approval of the plans. The applicant shall bear the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's subsequent plan review and approval process.

FACILITY 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 and restoration of the site. 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 for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;

- all applicable LORS, local/regional plans and 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.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) 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 proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable engineering LORS.
3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable engineering LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.
4. 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 as required in the **General Conditions** portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS.

RECOMMENDATIONS

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;
2. The project be designed and built to the 2001 CBSC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and
3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction. Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 2001 California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval. (The CBSC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.) All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when a successor to the 2001 CBSC is in effect, the 2001 CBSC 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 after receipt of the Certificate of Occupancy, the project owner shall submit to the 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 [2001 CBC, Section 109 – Certificate of Occupancy].

GEN-2 Prior to submittal of the initial engineering designs for CBO review, 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 list of proposed submittal packages of designs, calculations and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in **Facility Design Table 1** below. Major structures and equipment shall be added to or deleted from the table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1:
Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Combustion Turbine (CT) Foundation and Connections	2
Combustion Turbine Generator Foundation and Connections	2
Steam Turbine (ST) Foundation and Connections	1
Steam Turbine Generator Foundation and Connections	1
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	2
HRSG Stack Structure, Foundation and Connections	2
CT Air Inlet System Structure, Foundation and Connections	2
CT Main Transformer Foundation and Connections	2
ST Main Transformer Foundation and Connections	1
Unit Auxiliary Transformer Foundation and Connections	3
Generator Breakers Foundation and Connections	3
Water Treatment Building Structure, Foundation and Connections	1
Warehouse/Maintenance Building Structure, Foundation and Connections	1
Administration/Control Room Building Structure, Foundation and Connections	1
Power Distribution Center Structure, Foundation and Connections	1
Auxiliary Cooling Water Pumps Foundation and Connections	2
Circulating Water Pumps Foundation and Connections	2
Boiler Feed Pumps Foundation and Connections	2
Cooling Tower Structure, Foundation and Connections	1
Cooling Tower Electrical Building Structure, Foundation and Connections	1
Cooling Tower Chemical Feed Foundation and Connections	1
Service/Fire Water Storage Tank Structure, Foundation and Connections	1
Demineralized Water Storage Tank Structure, Foundation and Connections	1
Ammonia Storage Tank Foundation and Connections	1
Switchyard Control Building Structure, Foundation and Connections	1
HRSG Blowdown Tank Structure, Foundation and Connections	2
Fuel Gas Compressor Foundation and Connections	1
Water Wash Skid Foundation and Connections	1
Water Wash Sump Area Foundation and Connections	2
Ammonia Injection Skid Foundation and Connections	2
Oil/Water Separator Foundation and Connections	1
Zero Liquid Discharge System Structure, Foundation and Connections	1
Condenser and Auxiliaries Foundation and Connections	1
Air Compressor Foundation and Connections	1
Auxiliary Transformer Foundation and Connections	2
Fire Pump Skid Foundation and Connections	1

Equipment/System	Quantity (Plant)
Recycled Water Storage Tank Structure, Foundation and Connections	1
Condensate Pumps Foundation and Connections	3
Blowdown Storage Tank Structure, Foundation and Connections	1
Fire Protection System	1
Continuous Emissions Monitoring Systems Structure, Foundation and Connections	1
Potable Water Systems	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot
Substation/Switchyard, Buses and Towers	1 Lot
Electrical Duct Banks	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 2001 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], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities)]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

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 of work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all the facilities subject to CBO design review and inspection conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;
4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume 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 resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a soils engineer, or a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; and C) an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: D) a design engineer, who is either a structural engineer

or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; E) a mechanical engineer; and F) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all responsible engineers assigned to the project [2001 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:
    1. Review the Foundation Investigations Report, Geotechnical Report or Soils Report prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;
    2. Design, or be responsible for design, stamp, and sign all plans, calculations and specifications for proposed site work, civil works and related facilities requiring design review and inspection by the CBO. 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
    3. 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.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:
    1. Review all the engineering geology reports;

2. Prepare the Foundation Investigations Report, Geotechnical Report or Soils Report containing field exploration reports, laboratory tests and engineering analysis detailing the nature and extent of the soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load [2001 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations];
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2001 CBC, Appendix Chapter 33; Section 3317, Grading Inspections (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both); and
4. Recommend field changes to the civil engineer and RE.

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 [2001 CBC, section 104.2.4, Stop orders].

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare final soils grading report; and
2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2001 CBC, Appendix Chapter 33; Section 3317, Grading Inspections (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both).

D. 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 engineering LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

E. 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.

F. 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 project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible 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 resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2001 CBC, Chapter 17 [Section 1701, Special Inspections; Section 1701.5, Type of Work (requiring special inspection)]; and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Observe the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]; 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 (or project owner and CBO approved alternative timeframe) 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 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective action required [2001 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. 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 transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly Compliance Report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of 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 that has undergone CBO design review and approval. 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 [2001 CBC, Section 108, Inspections]. The project owner shall retain one set of approved engineering plans, specifications and calculations at the project site or at another accessible location during the operating life of the project [2001 CBC, Section 106.4.2, Retention of Plans].

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next Monthly Compliance Report, (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. After storing final approved engineering plans, specifications and calculations as described above, the project owner shall submit to the CPM a letter stating that the above documents have been stored and indicate the storage location of such documents.

CIVIL-1 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, Geotechnical Report or Foundation Investigations Report required by the 2001 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations].

Verification: At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design 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 soils engineer, geotechnical engineer, or the 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 [2001 CBC, Section 104.2.4, Stop orders].

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 2001 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, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO and the CPM [2001

CBC, Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

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 for review and approval. 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-built" grading plans for the erosion and sedimentation control facilities. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans [2001 CBC, Section 3318, Completion of Work].

Verification: Within 30 days (or project owner and CBO approved alternative timeframe) of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the final as-built grading plans and 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, with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Facility Design Table 1** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design 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 the following items (from **Table 1**, above):

1. Major project structures;
2. Major foundations, equipment supports and anchorage;
3. Large field fabricated tanks;
4. Turbine/generator pedestal; and
5. Switchyard structures.

Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

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 [2001 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 prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [2001 CBC, Section 106.4.2, Retention of plans; and Section 106.3.2, Submittal documents];
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 [2001 CBC, Section 106.3.4, Architect or Engineer of Record]; and
5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to the applicable LORS [2001 CBC, Section 106.3.4, Architect or Engineer of Record].

Verification: At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of construction of any structure or component listed in **Facility Design Table 1** of Condition of Certification **GEN-2** above, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next Monthly Compliance Report 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 engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

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 structural activities requiring special inspections shall be in accordance with the 2001 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 and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]. 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 2001 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 to 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 2001 CBC shall, at a minimum, be designed to comply with the requirements of this Chapter.

Verification: At least 30 days (or project owner and CBO approved alternate timeframe) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design 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 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in **Facility Design Table 1**, Condition of Certification **GEN-2**, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of said construction [2001 CBC, Section 106.3.2, Submittal Documents; Section 108.3, Inspection Requests; Section 108.4, Approval Required; 2001 California Plumbing Code, Section 103.5.4, Inspection Request; Section 301.1.1, Approval].

The responsible mechanical engineer shall stamp and sign all plans, drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

- 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);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- Specific City/County code.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [2001 CBC, Section 104.2.2, Deputies].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of major piping or plumbing construction listed in **Facility Design Table 1**, Condition of Certification **GEN-2** above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

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 [2001 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 project owner and CBO approved alternative timeframe) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, 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 transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. 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

[2001 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) 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 CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC 2001, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [2001 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans to include:
   1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
   2. system grounding drawings.

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; and
   7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the Monthly Compliance Report:
   1. Receipt or delay of major electrical equipment;
   2. Testing or energization of major electrical equipment; and

3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

TID (Turlock Irrigation District). 2002a. Application for Certification, Walnut Energy Center (02-AFC-4). Submitted to the California Energy Commission, November 19, 2002.

GEOLOGY, MINERAL RESOURCES, AND PALEONTOLOGY

Dal Hunter, Ph.D., C.E.G.

INTRODUCTION

In the geology, mineral resources, and paleontology section, staff discusses potential impacts of the proposed Walnut Energy Center (WEC) project regarding geologic hazards, geologic (including mineralogic), and paleontologic resources. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources during project construction, operation and closure. A brief geological and paleontological overview of the project is provided. The section concludes with staff's proposed monitoring and mitigation measures with respect to geologic hazards and geologic, mineralogic, and paleontologic resources, with the inclusion of conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicable laws ordinances, regulations and standards (LORS) are listed in the Application for Certification (AFC), in Section 8.15.2 of the AFC (TID, 2002). The following is a brief description of the LORS for geologic hazards and resources, and paleontologic resources.

FEDERAL

The proposed WEC is not located on federal land. As such, there are no federal LORS for geological hazards and resources or grading for the proposed project.

STATE AND LOCAL

The project shall be designed and constructed to the 2001 edition of the California Building Standards Code (CBSC). The CBSC includes a series of standards that are used in project investigation, design and construction (including grading and erosion control.

The California Environmental Quality Act 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 geologic hazards.
- Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The "Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures" (Society of Vertebrate Paleontology [SVP], 1995) is a set of procedures and standards for assessing and mitigating impacts

to vertebrate paleontological resources. They were adopted in October 1995 by the Society of Vertebrate Paleontology (SVP), a national organization of professional scientists.

ENVIRONMENTAL SETTING

The proposed WEC is located within the Central Valley geomorphic province in Stanislaus County, California. This area within the Central Valley is characterized by gently sloping alluvial fans formed by outwash from rivers and streams draining the Sierra Nevada mountain range to the east. Alluvial fans present in the area are composed of materials exposed within the drainages of the rivers and streams of the western Sierra Nevada. Major geologic units in the vicinity of the site include recent Holocene deposits and the Quaternary Modesto and Riverbank Formations (Higgins and Dupras, 1993; Marchand, 1980; Marchand and Allwardt, 1978; and Marchand, 1976. The recent Holocene deposits consist of river channel and flood plain deposits. The Quaternary Modesto Formation consists of alluvial fan deposits of containing discontinuous and interbedded clay, silt, and sand. The Quaternary Riverbank Formation is closely related to the Modesto Formation and contains the Corcoran Clay, a distinctive geologic marker bed.

Exploration adjacent to the WEC plant site by the applicant generally encountered silty sand, poorly graded sand, and minor silt and clayey sand (Condor, 2003). The coarse-grained soils, including silty sand, poorly graded sand, and clayey sand are generally classified as brown to dark brown, loose to medium dense, and as exhibiting low plasticity. The silt soils are generally classified as light brown to brown and as exhibiting low plasticity.

ANALYSIS AND IMPACTS

There are two types of impacts considered in this section. The first are geologic hazards, which could impact proper functioning of the proposed facility and include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, and tsunamis and seiches. The second considers potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area.

STAFF'S CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE

There are no federal LORS with respect to geologic hazards and geologic and mineralogic resources; however, the California Building Standards Code (CBSC) provides geotechnical and geological investigation and design guidelines, which engineers must adhere to when designing a proposed facility. As a result, the criteria used to assess geologic hazard impact significance includes evaluating each potential hazard in relation to being able to adequately design and construct the proposed facility.

With respect to impacts, the proposed facility may have on existing geologic and mineralogic resources, geologic and mineral resource maps for the surrounding area have been reviewed, in addition to any site-specific information provided by the applicant, to determine if geologic and mineralogic resources are present in the area.

When available, operating procedures of the proposed facility, in particular ground water extraction and mass grading operations, are reviewed to determine if such operations could adversely impact such resources.

Staff reviewed existing paleontologic information for the surrounding area, as well as any site-specific information provided by the applicant, in accordance with accepted assessment protocol (SVP, 1995) to determine if there are any known paleontologic resources in the general area. If present or likely to exist, conditions of certification are applied to project approval, which outline procedures required during construction to mitigate impacts to potential resources.

GEOLOGIC HAZARDS

The Application for Certification (AFC) (TID, 2002) provides adequate documentation of potential geologic hazards at the WEC plant site. Review of the AFC, coupled with our independent research, indicates that potential geologic hazards at the site are moderate. Our independent research included review of available geologic maps, reports, and related data of the WEC plant site and associated linear facility areas. Geological information was available from the California Geological Survey (CGS), U. S. Geological Survey (USGS), and other governmental organizations.

Detailed geological discussion and information about the project's linear facilities was not included in the AFC (TID, 2002). However, given the geology and borings present at an adjacent site to the plant, the potential for these geologic hazards along the linear facilities is high. In order to accurately assess the potential for liquefaction, dynamic compaction, hydrocompaction, subsidence, and expansive soils along the linear facilities, subsurface exploration and associated laboratory testing and analyses should be performed during the design-level geotechnical investigation per Condition of Certification GEO-1. Although there are no current standards that require linear facilities to be designed to resist fault rupture or liquefaction, even when these facilities cross an active fault (Anderson, 2001) it is prudent to address these constraints in the design-level investigations.

Faulting and Seismicity

Energy Commission staff reviewed the California Geological Survey (CGS) publication Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions (Jennings, 1994), Geologic Map of California – San Francisco-San Jose Sheet (Wagner et al., 1990), Alquist-Priolo Zones (CGS, 2000), the Database of Potential Sources for Earthquakes Larger than Magnitude 6 in Northern California (USGS, 1996), and Maps of Known Active Fault Near-source Zones in California and Adjacent Parts of Nevada (International Conference of Building Officials [ICBO], 1998). The project is located within Seismic Zone 3 as delineated on Figure 16-2 of the CBSC.

The closest known active (Holocene Age) fault is the Great Valley Thrust Fault System, approximately 21-miles west of the site. The fault is a blind thrust (no surface expression) and is divided into a number of segments. Segment 8 is the closest; however, Segment 7 is only 0.1-miles further to the west. Staff has calculated an estimated deterministic peak horizontal ground acceleration for the plant site in the range of 0.2g. This estimate is based upon a moment magnitude 6.7 earthquake on

Segment 7 of the Great Valley Thrust Fault, which has a potentially higher moment magnitude than the slightly closer Segment 8. Other active faults within the vicinity of the site include the Ortigalita Fault, Great Valley Thrust Fault (Segment 9), and the Foothills Fault System. The CBSC designates a minimum design ground acceleration of 0.3g for the entire project. The closest pre-Holocene fault is located approximately 17.5 miles northwest of the plant site (Jennings, 1994). Pre-Holocene age faults are only considered potentially active.

Liquefaction

Liquefaction is a nearly complete loss of soil shear strength that can occur during an earthquake. During the seismic event, cyclic shear stresses cause the development of excessive pore water pressure between the soil grains, effectively reducing the internal strength of the soil. This phenomenon is generally limited to unconsolidated, clean to silty sand (up to 35 percent non-plastic fines) and very soft silts lying below the ground water table. The higher the ground acceleration caused by a seismic event, the more likely liquefaction is to occur. Severe liquefaction can result in catastrophic settlements of overlying structural improvements and lateral spreading of the liquefied layer when confined vertically but not horizontally. Exploration at the plant site generally encountered silty sand, poorly graded sand, and thin silty clay and lean clay with sand. Since the site is underlain by loose to medium dense, saturated silty sands and poorly graded sand and the depth to ground water is approximately 8 feet to 10 feet; the potential for liquefaction is high.

Dynamic Compaction

Dynamic compaction of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events or even large, vibrating machinery. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase in soil density). The decrease in volume can result in settlement of overlying structural improvements. Since the site is underlain by loose to medium dense, silty sands and poorly graded sand, the potential for dynamic compaction is high.

Hydrocompaction

Partially saturated soils can possess bonds that are a result of chemical precipitates that accumulate under semi-arid conditions. Such soluble compound bonds provide the soils with cohesion and rigidity; however, these bonds can be destroyed upon wetting. When destroyed, a substantial decrease in the material's void ratio is experienced even though the vertical pressure does not change. Materials that exhibit this decrease in void ratio and corresponding decrease in volume with the addition of water are defined as collapsible soils. Collapsible soils are typically limited to true loess, fine flash flood deposits, clayey loose sands, loose sands cemented by soluble salts, and windblown silts. Since the site is underlain by loose to medium dense silty sands and poorly graded sand and are generally saturated (below the ground water table), the potential for hydrocompaction is negligible.

Subsidence

Ground subsidence is typically caused when ground water is drawn down by irrigation activities or municipal wells, such that the effective unit weight of the soil mass is increased, which in turn increases the effective stress on underlying soils, resulting in

consolidation/settlement of the underlying soils. Subsidence may also be caused by regional tectonic processes. Typically, these forms of subsidence affect a large area. Since the WEC will obtain cooling water from the City of Turlock Regional Wastewater Treatment Plant (WWTP) by May 2006, subsidence due to ground water withdrawal for the project is expected to result in no foundation settlement that would impact the plant. During the interim period between plant startup and May 2006, the WEC plant will obtain cooling water from the City of Turlock's potable water supply (TID, 2002). The WEC plant site is not within a zone mapped by Bertoldi et al. (1991) as an area with ground subsidence greater than one foot due to water level decline. As a consequence of the above factors, subsidence is not expected to be of concern for this project.

Expansive Soils

Soil expansion occurs when clay-rich soils, with an affinity for water, exist in-place at a moisture content below their plastic limit. The addition of moisture from irrigation, capillary tension, water line breaks, etc. causes the clay soils to collect water molecules in their structure, which, in turn, causes an increase in the overall volume of the soil. This increase in volume can correspond to movement of overlying structural improvements. As reported in the boring logs, the site generally is underlain by silty sand, poorly graded sand, silty clay, and lean clay soils (Condor, 2003). A low to medium potential for expansion may be present in the silty clay and lean clay soils given the limited geotechnical testing data available.

Landslides

Landslides typically involve rotational slump failures within surficial soils/colluvium and/or weakened bedrock that are usually implemented by an increase of the material's moisture content above a layer which exhibits a relatively low strength. Debris-flows are shallow landslides that travel downslope very rapidly as muddy slurry. Since the site, transmission lines, and linear pipeline areas are generally topographically flat, the potential for landslides is negligible.

Tsunamis and Seiches

Tsunamis and seiches are earthquake-induced waves, which inundate low-lying areas adjacent to large bodies of water. The proposed site is situated approximately 84 feet above mean sea level. The San Francisco Bay and San Joaquin/Sacramento River Delta are located approximately 60 miles to the northwest of the site. No other large bodies of water are present near the plant site or associated linear facilities. As a result, the potential for tsunamis and seiches to affect the site is considered negligible.

GEOLOGIC, MINERALOGIC, AND PALEONTOLOGIC RESOURCES

Energy Commission staff have reviewed applicable geologic maps and reports for this area (Kohler, 2002; Larose et al., 1999; Higgins and Dupras, 1993; DOGGR, 1982; and Tooker and Beeby, 1990). Based on this information and the information contained in the AFC (TID, 2002), there are no known mineralogic resources located at or immediately adjacent to the proposed WEC plant site.

The applicant's consultant conducted a paleontologic resources field survey and a sensitivity analysis for the proposed WEC and the proposed linear facility improvements to support the WEC. No significant fossil localities were identified at the WEC site or directly under the associated linear facilities. However, fossils were found in similar

geologic units (Modesto Formation) adjacent to the proposed linear facilities and within 2,000 feet of the plant site. Near-surface geologic units, including the Modesto Formation, were assigned a “high” sensitivity rating with respect to potentially containing paleontological resources. Staff asked the University of California, Museum of Paleontology (UCMP) for a literature review and a check of the Regional Paleontologic Locality Inventory (RPLI). In an e-mail dated December 19, 2002, UCMP verified that to date, no known paleontological resources have been identified at the plant site or along associated linear facilities. Based on review of available information, staff concludes that because the results of the sensitivity analysis are high, and because these resources are known to exist in similar units in the vicinity of the plant site, the proposed WEC project has high potential to expose significant paleontologic resources during grading and excavating activities.

PROJECT SPECIFIC IMPACTS

Liquefaction and dynamic compaction potential represents the main geologic hazards at this site. No geologic or mineralogic resources are known to exist in the area. Conditions of Certification **GEN-1**, **GEN-5**, **CIVIL-1** (**Facility Design**) and **GEO-1** should mitigate these impacts to a level of less than significant. The (confidential) Paleontologic Resources Report (TID, 2002) assigns a sensitivity rating of high for all geologic units, which underlie the proposed facility and associated linears. **PAL-1** to **PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level.

CUMULATIVE IMPACTS

The WEC site lies in an area which exhibits moderate geologic hazards and no known geologic or mineralogic resources. Based on this information and the proposed conditions of certification to mitigate potential project specific impacts, it is staff’s opinion that the potential for significant adverse cumulative impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the proposed project, is low.

FACILITY CLOSURE

A definition and general approach to closure is presented in the **General Conditions** section of this assessment. Facility closure activities are not anticipated to impact geologic, mineralogic, or paleontologic resources. This is due to the fact that no such resources are known to exist at the proposed project site. In addition, decommissioning and closure of the power plant should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of the ground disturbed in plant decommissioning and closure will have been disturbed during construction and operation of the facility.

RESPONSE TO PUBLIC AND AGENCY COMMENT

Staff has not received comments regarding geology, paleontology or surface water from the public or local agencies at this time.

CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis, staff believes that the applicant will comply with all applicable LORS. If constructed as proposed in the AFC, the project will have no adverse impact on geologic or mineralogic resources with respect to design and construction of the project. Staff proposes to ensure compliance with applicable LORS and the protection of potential paleontologic resources with the adoption of the proposed conditions of certification listed below.

PROPOSED CONDITIONS OF CERTIFICATION

General conditions of certification with respect to Geology are covered under conditions of certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **Facility Design** section and include **GEO-1** below. Paleontological Conditions of Certification **PAL-1 through PAL-7** follow.

GEO-1 The Soils Engineering Report required by the 2001 CBSC Appendix Chapter 33, Section 3309.5 Soils Engineering Report, shall specifically include data regarding the liquefaction and dynamic compaction potential of site soils. The liquefaction analysis shall be implemented by following the recommended procedures contained in *Recommended Procedures for Implementation of California Division of Mines and Geology Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California* dated March 1999.

Verification: The project owner shall include in the application for a grading permit a copy of Soils Engineering Report which describes the collapse, expansion, and liquefaction potential of the site foundation soils and a summary of how the results of the analyses were incorporated into the project foundation and grading plan design for review and comment by the Chief Building Official (CBO).

PAL-1 The project owner shall provide the CPM with the resume and qualifications of its Paleontological Resource Specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall submit to the CPM to keep on file, resumes of the qualified Paleontological Resource Monitors (PRMs). If a PRM is replaced, the resumes of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. institutional affiliations, appropriate credentials and college degree; ability to recognize and collect fossils in the field;

2. local geological and biostratigraphic expertise;
3. proficiency in identifying vertebrate and invertebrate fossils and;
4. 4. the PRS shall have at least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

BS or BA degree in geology or paleontology and one year experience monitoring in California; or
AS or AA in geology, paleontology or biology and four years experience monitoring in California; or
Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification: (1) At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

(2) At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.

(3) Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction laydown areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would normally be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and can be of such as scale that 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the power plant or linear facility changes, the project owner shall provide maps and drawings reflecting these changes to the PRS and CPM.

If construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior to

work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

Verification: (1) At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS and CPM.

(2) If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.

(3) If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting and sampling activities and may be modified with CPM approval. This document shall be used as a basis for discussion in the event that on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of the Vertebrate Paleontology (SVP, 1995) and shall include, but not be limited to, the following:

1. Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and collection; identification and inventory; preparation of final reports; and transmittal of materials for curation will be performed according to the PRMMP procedures;
2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the conditions of certification;
3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed schedule for the monitoring and sampling;

5. A discussion of the procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;
6. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
7. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontology standards and requirements for the curation of paleontological resources;
8. Identification of the institution that has agreed to receive any data and fossil materials collected, 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; and
9. A copy of the paleontological conditions of certification.

Verification: At least (30) days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for all recently employed project managers, construction supervisors and workers who are involved with or operate ground disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of an initial in-person PRS training during the project kick-off for those mentioned above. Following initial training, a CPM-approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

The Worker Environmental Awareness Program (WEAP) shall address 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 include:

1. A discussion of applicable laws and penalties under the law;
2. Good quality photographs or physical examples of vertebrate fossils shall be provided for project sites containing units of high sensitivity;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;

4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: (1) At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.

(2) At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.

(3) If an alternate paleontological trainer is requested by the project owner, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.

(4) In the Monthly Compliance Report (MCR) the project owner shall provide copies of the WEAP Certification of Completion forms with the names of those trained and the trainer or type of training offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitors consistent with the PRMMP, all construction-related grading, excavation, trenching, and augering in areas where potentially fossil-bearing materials have been identified. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring. The letter or email shall include the justification for the change in monitoring and submitted to the CPM for review and approval.
2. The project owner shall ensure that the PRM(s) keeps a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.

3. The project owner shall ensure that the PRS immediately notifies the the CPM of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM immediately (no later than the following morning after the find, or Monday morning in the case of a weekend) of any halt of construction activities.

The project owner shall ensure that the PRS prepares a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports (MCR). The summary will include the name(s) of PRS or PRM(s) active during the month, general descriptions of training and monitored construction activities and general locations of excavations, grading, etc. A section of the report will include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of fossils identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the project shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the project construction.

Verification: The project owner shall maintain in their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resource Report (See **PAL-7**). The project owner shall be responsible to pay any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submitted to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated.

Verification: Within (90) days after completion of ground disturbing activities, including landscaping, the project owner shall submit the Paleontological Resources Report under confidential cover to the CPM.

Certification of Completion of Worker

Environmental Awareness Program
WALNUT ENERGY CENTER (02-AFC-4)

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on Cultural, Paleontology and Biological Resources for all personnel (i.e. construction supervisors, crews and plant operators) working on-site or at related facilities. By signing below, the participant indicates that they understand and shall abide by the guidelines set forth in the Program materials. Please include this completed form in the Monthly Compliance Report.

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Cul Trainer: _____ Signature:_____ Date: ___/___/____
PaleoTrainer: _____ Signature:_____ Date: ___/___/____
Bio Trainer: _____ Signature:_____ Date: ___/___/____

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POWER PLANT EFFICIENCY

Kevin Robinson and Steve Baker

INTRODUCTION

The Energy Commission, in its decision, must make findings as to whether energy use by the Walnut Energy Center (WEC) 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 WEC'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:

- examine whether the facility will likely present any adverse impacts upon energy resources;
- examine whether these adverse impacts are significant; and if so,
- examine 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 LORS apply to the efficiency of this project.

STATE

No State LORS apply to the efficiency of this project.

LOCAL

No local or county ordinances apply to power plant efficiency.

SETTING

The applicant proposes to construct and operate the 250 MW (nominal gross output) combined cycle, WEC power plant to generate baseload and load following power, providing power to the Turlock Irrigation District (TID) customers (TID 2002a, AFC §§ 1.2.1, 2.2.16, 2.4.1, 10.3.2, 10.4). (Note that this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity may differ from this figure.) The WEC will consist of two General Electric (GE) Frame 7-EA combustion gas turbines with evaporative inlet air coolers/filters, two multi-pressure heat recovery steam generators (HRSGs), and one single three-pressure, reheat, condensing steam turbine (ST) generator, arranged in a two-on-one combined cycle train, totaling approximately 250 MW. The gas turbines and HRSGs will be equipped with dry low-NOx combustors and

selective catalytic reduction to control air emissions (TID 2002a, AFC §§ 1.2, 2.1, 2.2, 2.2.4.1, 2.2.4.2, 2.2.11, 2.4.2.1). Natural gas will be delivered by the existing Pacific Gas and Electric (PG&E) gas distribution system from line 215 through a new 3.6-mile section of 8-inch pipeline (TID 2002a, AFC §§ 1.2, 2.1, 2.2.6, 2.4.3, 6.1, 10.3.1).

ANALYSIS

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).

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

Project Energy Requirements And Energy Use Efficiency

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. Under normal conditions, the WEC will burn natural gas at a nominal rate of 2,095 MMBtu per hour, higher heating value (HHV) (TID 2002a, AFC §§ 2.2.6, 10.4). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies. Under expected project conditions, electricity will be generated at a full load thermal efficiency of approximately 50 percent, lower heating value (LHV) (TID 2002a, AFC § 10.4); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

Adverse Effects On Energy Supplies And Resources

The Applicant has described its sources of supply of natural gas for the project (TID 2002a, AFC §§ 1.2, 2.1, 2.2.6, 2.4.3, 6.1, 10.3.1). Natural gas for the WEC will be supplied from the existing PG&E gas distribution system from line 215 through a new 3.6-mile section of 8-inch pipeline. The PG&E system is capable of delivering the required quantity of gas to the WEC. Furthermore, the PG&E gas supply infrastructure is extensive, offering access to vast reserves of gas. This source represents far more gas than would be required for a project this size. It is therefore highly unlikely that the project could pose a substantial increase in demand for natural gas in California.

Additional Energy Supply Requirements

Natural gas fuel will be supplied to the project by the existing PG&E gas distribution system from line 215 through a new 3.6-mile section of 8-inch pipeline (TID 2002a, AFC §§ 1.2, 2.1, 2.2.6, 2.4.3, 6.1, 10.3.1). There is no real likelihood that the WEC will require the development of additional energy supply capacity.

Compliance With Energy Standards

No standards apply to the efficiency of the WEC or other non-cogeneration projects.

Alternatives To Reduce Wasteful, Inefficient And Unnecessary Energy Consumption

The WEC 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 WEC will be configured as a combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a reheat steam turbine that operates on heat energy recuperated from the gas turbines' exhaust (TID 2002a, AFC §§ 1.2, 1.2.1, 2.2.4, 10.4). 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 Applicant proposes to use inlet air coolers, three-pressure HRSGs and a steam turbine unit and circulating water system (TID 2002a, AFC §§ 1.2, 1.2.1, 2.2, 2.2.3, 2.2.4.1, 2.2.4.2, 2.2.4.3, 2.2.7, 2.2.8). Staff believes these features contribute to meaningful efficiency enhancement to the WEC. The two-train CT/HRSG configuration also allows for high efficiency during unit turndown because one CT can be shut down, leaving one fully loaded, efficiently operating CT instead of having two CTs operating at an inefficient 50 percent load.

Equipment Selection

The applicant will employ two General Electric (GE) Frame 7-EA combustion gas turbine generators in a two-on-one combined cycle power train (TID 2002a, AFC §§ 1.2, 2.1, 2.2, 2.2.4.1, 2.4.2.1, 10.4). This configuration is nominally rated at 263 MW and 50.9 percent efficiency LHV at ISO conditions (GTW 2002).

One possible alternative is the Siemens-Westinghouse 501F, nominally rated in a one-on-one train combined cycle configuration at 283 MW and 56 percent efficiency LHV at ISO conditions (GTW 2002).

Another alternative is the General Electric GE 7FA, nominally rated in a one-on-one train combined cycle configuration at 263 MW and 56 percent efficiency LHV (GTW 2002).

Another alternative machine is the Alstom Power KA24, nominally rated in a one-on-one train combined cycle configuration at 260 MW and 56.5 percent LHV at ISO conditions (GTW 2002).

The GE Frame 7-EA gas turbine generator has been on the market since 1984, and does not represent the current standard in fuel efficiency. While operation of the WEC represents an adverse impact on energy resources, Energy Commission staff believes it does not constitute a significant impact because the project's maximum fuel consumption, 2,095 MMBtu per hour, is not a significant portion of natural gas supply to California.

Efficiency Of Alternatives To The Project

The project objectives include generation of baseload electricity and load following power to the TID customers, as market conditions dictate (TID 2002a, AFC §§ 2.2.16, 2.4.1, 10.4).

Alternative Generating Technologies

Alternative generating technologies for the WEC are considered in the AFC (TID 2002a, AFC §§ 1.6, 9.0, 9.6, 9.7). Fossil fuels, nuclear, solar, wind, hydroelectric, and biomass 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.

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 gas turbines, incorporating technological advances made in the development of aircraft (jet) engines, combined with the cost advantages of assembly-line manufacturing, has made available machines that not only offer the lowest available fuel costs, but at the same time sell for the lowest per-kilowatt capital cost.

The Frame 7(EA) is not an aeroderivative machine, but rather a heavy-frame industrial-type machine. Its compressor and turbine blades are all fastened to a single shaft and all spin at the same speed, whereas the aeroderivative machines have two or three shafts spinning at different speeds. The two-shaft design allows more effective aerodynamic design of the machine, resulting in a pressure ratio (equivalent to the compression ratio in an automobile engine) twice that of the 7(EA). The higher-

pressure ratio helps the aeroderivative machines exhibit greater fuel efficiency than the 7(EA).

While any of the aeroderivative machines listed above (W501F, GE 7FA, Alstom KA24) would exhibit greater fuel efficiency than the machines chosen for the WEC, staff believes the Frame 7(EA) is an acceptable choice for the project since the heavy-duty Frame machines typically exhibit greater reliability than the aeroderivative machines (see **Power Plant Reliability**). Reliability is crucial in a power plant such as the WEC.

Inlet Air Cooling

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler or fogger, and the chiller; both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler or a fogger boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ evaporative inlet air-cooling (TID 2002a, AFC §§ 2.2.4.1, 2.2.7.1). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

Conclusions on Efficiency of Alternatives

In conclusion, the project configuration chosen (two on one combined cycle) appears to represent an effective means of satisfying the project objectives. While operation of the WEC represents an adverse impact on energy resources, Energy Commission staff believes it does not constitute a significant impact because the project's maximum fuel consumption, 2,095 MMBtu per hour, is not a significant portion of natural gas supply to California.

Staff, therefore, believes the WEC will not constitute a significant adverse impact on energy resources.

CUMULATIVE IMPACTS

There are no nearby power plant projects that hold the potential for cumulative energy consumption impacts when aggregated with the project. Staff knows of no other projects that could result in cumulative energy impacts.

Staff believes that construction and operation of the project will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for the project. The older, less efficient power plants consume more natural gas to operate than the new, more efficient plants such as the WEC. The high efficiency of the proposed WEC should allow it to compete very favorably, running at a high capacity

factor, replacing less efficient power generating plants, and therefore not impacting or even reducing the cumulative amount of natural gas consumed for power generation.

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 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 project, if constructed and operated as proposed, would generate a nominal 250 MW of electric power at an overall project thermal efficiency of 50 percent LHV. It will consume substantial amounts of energy, but will not require additional sources of energy supply. While more efficient alternatives exist, staff believes that the project would present no significant adverse impacts upon energy resources. No energy standards apply to the project.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

No Conditions of Certification are proposed.

REFERENCES

GTW (Gas Turbine World). 2002. Gas Turbine World, January-February 2002, pages 28-35.

TID (Turlock Irrigation District). 2002a. Application for Certification, Walnut Energy Center (02-AFC-4). Submitted to the California Energy Commission, November 18, 2002.

POWER PLANT RELIABILITY

Kevin Robinson and Steve Baker

INTRODUCTION

In this analysis, Energy Commission staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While the Turlock Irrigation District (TID) has predicted a 92 to 98 percent availability for the Walnut Energy Center (see below), staff uses the benchmark identified above, rather than Turlock Irrigation District's projection, to evaluate the project's reliability.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system (see **Setting** below).

SETTING

The responsibility for overseeing system reliability falls largely to the Western Electricity Coordinating Council (WECC), an entity that is responsible for coordinating and promoting electric system reliability throughout the nine western states. The WECC has reliability, operating, and planning standards, criteria and guidelines necessary to maintain the reliable operation of the Western Interconnection's interconnected bulk power system. As a member of the WECC, the Applicant should adhere to the guidelines of the WECC and the North American Electric Reliability Council (NERC) in order to supply the TID customers with a reliable source of power.

As part of their plan to provide needed reliability, the Applicant proposes to operate the 250 MW (nominal output) Walnut Energy Center (WEC), providing power to the TID customers (TID 2002a, AFC §§ 1.2.1, 2.2.16, 2.4.1, 10.3.2, 10.4). The project is expected to operate at an overall availability in the range of 92 to 98 percent (TID 2002a, AFC §§ 2.2, 2.2.16, 2.4.1, 10.3.2), and at a capacity factor, over the life of the plant, of 25 to 100 percent of base load (TID 2002a, AFC §§ 2.4.1, 10.3.2).

ANALYSIS

The availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages subtract from its availability. Measures of power plant reliability are based on its actual ability to generate power when it is considered available and are based on starting failures and unplanned, or forced, outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life (TID 2002a, AFC §§ 2.4.1, 10.3.2), the WEC will be expected to perform reliably. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the WEC will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/ quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

Quality Control Program

The Applicant describes a QA/QC program (TID 2002a, AFC § 2.4.5) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. 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 (TID 2002a, AFC §§ 1.2, 2.1, 2.2, 2.4.2, 2.4.2.2, 2.4.2.7, Table 2.4-1). The fact that the project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output). Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency DC and AC power systems will be supplied by redundant batteries, chargers, and inverters. Other balance of plant equipment will be provided with redundant examples, including:

- four 100 percent HRSG feedwater pumps;
- three 50 percent condensate pumps;
- two 50 percent circulating water pumps; and
- two 100 percent auxiliary cooling water pumps.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

Maintenance Program

The Applicant proposes to establish a preventive plant maintenance program typical of the industry (TID 2002a, AFC § 2.4.1). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. **The program will encompass preventive and predictive maintenance techniques. Maintenance outages will be planned for periods of low electricity demand.** In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

Fuel Availability

The WEC will burn natural gas from the Pacific Gas and Electric (PG&E) distribution system. Natural Gas will be transmitted to the plant via a new 3.6-mile section of 8-inch pipeline connected to the PG&E gas supply system (TID 2002a, AFC §§ 1.2, 2.1, 2.2.6, 2.4.3, 6.1, 10.3.1). This PG&E natural gas system represents a resource of considerable capacity. This system offers access to adequate supplies of gas (TID 2002a, AFC § 10.3.1). Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

The WEC will obtain recycled water for cooling tower make-up from the City of Turlock's Waste Water Treatment Plant via a new 1.6-mile section of 12- to 24-inch diameter pipeline (TID 2002a, AFC §§ 1.2, 2.1, 2.2.7, 2.2.7.1, 2.2.7.2, 2.2.7.4.3, 2.2.8). The applicant predicts average process and cooling water consumption of approximately 1,400,000 gallons per day (gpd). Potable water will be provided by the City of Turlock via a new 8- to 12-inch pipeline connected to an existing water main (TID 2002a, AFC §§ 1.2, 2.1, 2.2.7, Table 2.2-1). Staff believes these sources yield sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see the **Soil and Water Resources** section of this document.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, flooding, tsunamis (tidal waves), and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but seismic shaking (earthquake) present credible threats to reliable operation.

Seismic Shaking

The site lies within Seismic Zone 3 (TID 2002a, AFC §§ 2.3.1, 8.15); see that portion of this document entitled **Geology, Mineral Resources, and Paleontology**. The project will be designed and constructed to the latest appropriate LORS (TID 2002a, AFC §§ 2.3.1, 8.15, Appendix 10). Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see that portion of this document entitled **Facility Design**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (http://www.nerc.com). NERC reports the following summary generating unit statistics for the years 1997 through 2001 (NERC 2003):

For Combined Cycle units (All MW sizes)
Availability Factor = 90.31 percent

The 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 in the 92 to 98 percent range (TID 2002a, AFC §§ 2.2, 2.2.16, 2.4.1, 10.3.2) appears reasonable compared to the NERC

figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. Further, since the plant will consist of two parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability, therefore, appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact power plant reliability. Reliability impacts on the electric system from facility closure, should there be any, are discussed in the **Transmission System Engineering** section of this document.

CONCLUSION

Turlock Irrigation District predicts an equivalent availability factor in the 92 to 98 percent range, which staff believes is achievable in light of the industry norm of 90.31 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. No Conditions of Certification are proposed.

REFERENCES

Detmers, Jim. 1999. Director of Maintenance and Reliability, California Independent System Operator. Interview with Steve Baker (California Energy Commission), July 13, 1999.

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). 2003. 1997-2001 Generating Availability Report.

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TRANSMISSION SYSTEM ENGINEERING

Sudath Arachchige, Demy Bucaneg -PE and Al McCuen

SUMMARY OF CONCLUSIONS

Staff concludes that the proposed Walnut Energy Center (WEC) switchyard, outlet lines, and termination are acceptable and would comply with all applicable laws, ordinances, regulations, and standards (LORS). These conclusions are contingent on the following assumptions: (1) Under normal operating conditions, both combustion and steam generators do not operate simultaneously on the 69kV system; (2) The adjacent utilities, Modesto Irrigation District (MID) and City of Merced (MERCED), confirm the acceptability of the System Impact Study (SIS) and select proposed mitigation measures, and (3) The proposed conditions of certification TSE-1 through TSE-8 are implemented. No additional new transmission facilities, other than those proposed by the applicant, are required for the interconnection of the 250MW Walnut Energy Center (WEC).

INTRODUCTION

The Transmission System Engineering (TSE) analysis identifies whether or not the transmission facilities associated with the proposed project conform to all applicable LORS required for safe and reliable electric power transmission, and assesses whether or not the applicant has accurately identified all interconnection facilities required as a result of the project.

Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant and provide proposed conditions of certification to ensure the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

Additionally, 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 (California Code of Regulations, title 14, §15378).Therefore, the Energy Commission must identify and evaluate the environmental effects of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid. This evaluation must include any facilities beyond the project's interconnection with the existing transmission system, through such facilities are not under the permit authority of the California transmission system.

Turlock Irrigation District (Applicant or TID) has filed an Application for Certification (AFC) with the California Energy Commission (CEC) for the Walnut Energy Center (WEC) project. TID will construct the WEC project in Stanislaus County, California. The WEC project will be a natural-gas-fired, combined-cycle generating facility consisting of two combustion turbine generators (CTG) and one steam turbine generator (STG). WEC will have a nominal capacity of 250MW. The project will connect to the Walnut-Hilmar 115kV and the Walnut-Industrial 69kV power lines of the TID power system. Interconnection will be executed through the 69kV and 115kV

switchyards located at the WEC project facility site (TID 2002a, AFC Volume 1, Section 2 & 5).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 52 (GO-52), Rules in the matter of the construction and operation of power and communication lines for the prevention or mitigation of inductive interference.
- 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.
- California Public Utilities Commission (CPUC) General Order 128 (GO-128), “Rules for Construction of Underground Electric Supply and Communications Systems,” formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.
- California Public Utilities Commission (CPUC) General Order 131D (GO-131D), Rules relating to the planning and construction of electric generation, transmission/power/distribution line facilities and substations.
- The National Electric Safety Code (NESC C2-1997) covers basic provisions for safeguarding of persons from hazards arising from the installation, operation, or maintenance of 1) conductors and equipment in electric supply stations, and 2) overhead and underground electric supply and communications lines. Its rules cover supply and communication lines, equipment, and associated work practices employed by a public or private electric supply, communications, railway, or similar utility in the exercise of its function as a utility. They cover similar systems under the control of qualified persons, such as those associated with an industrial complex or utility interactive system.
- North American Reliability Council (NERC)/Western Electricity Coordinating Council (WECC, August 9.2002) Planning Standards merge the WECC Planning Standards into the NERC Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards. These standards provide planning of electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of the standards, “NERC/WECC Planning Standards with Table I and WECC Disturbance-Performance Table” and on Section I.D,

"NERC/WECC Standards for Voltage Support and Reactive Power." These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines in a right of way and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted.

California ISO (Cal-ISO February 7, 2002) Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the Cal-ISO transmission grid facilities. The Cal-ISO Grid Planning Standards incorporate the NERC/WECC Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to NERC/WECC Planning Standards for Transmission Systems Contingency Performance. However, the Cal-ISO Standards also provide some additional requirements that are not found in the NERC/WECC Planning Standards. The Cal-ISO Standards apply to all participating transmission owners interconnecting to the Cal-ISO controlled grid. They also apply when there are any impacts to the Cal-ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the Cal-ISO.

EXISTING FACILITIES AND RELATED SYSTEMS

The proposed WEC facility is adjacent to two power lines; the Walnut-Hilmar 115kV Line and the Walnut-Industrial 69kV Lines 1 & 2. The 115kV line extends from the Walnut Substation to the Hilmar Substation. The two-69kV lines traverse between Walnut and Industrial Substations. An existing 50MVA (see definition of terms) Walnut Power Plant is also connected to the Walnut Substation. TID interconnects with Pacific Gas and Electric Company (PG&E) at the Westley Switchyard through the Walnut-Westley 230kV Transmission Line. Other facilities directly interface at the Walnut Substation including Parker, Commons, Fairground and Pioneer Substations via 230kV, 115kV and 69kV power lines. The Generation, substation and line facilities are owned and operated by TID, City of Merced (Merced), Modesto Irrigation District (MID) or PG&E (TID 2002b, AFC Volume 2, Switching Diagram, DWG# SD950 and SD951).

PROJECT DESCRIPTION

The WEC project will be a combined-cycle generating facility with an estimated net plant capacity of 250MW. The generating facility will be configured to utilize two natural-gas-fired CTG and one STG. Each CTG will generate approximately 84MW and the STG will produce approximately 100MW. The WEC generating facility includes the 115kV switchyard, 69kV switchyard and auxiliary power supply to the combustion turbine and steam turbine power block. The Applicant has proposed two points of interconnection

for the WEC project at the Walnut-Hilmar 115kV Line and at the Walnut-Industrial 69kV Line 2 respectively (TID 2002a, AFC Volume 1, Sections 2 & 5).

SWITCHYARD FACILITIES

The STG and CTGs will be totally enclosed water and air-cooled synchronous-type generators that will produce power for the WEC project at 13.8kV. One CTG will connect to a 115/69kV generator step-up (GSU) transformer via a 13.8kV circuit breaker. This transformer will then be connected through a disconnect switch to the 115kV switchyard.

The second CTG's output will pass through a 13.8kV circuit breaker. From the circuit breaker, the 13.8kV circuit will branch to the 69/13.8kV GSU transformer and to the 13.8/4.16kV unit auxiliary transformer. The high voltage bushings of this generator step-up transformer will interface with the 69kV switchyard via a 69kV disconnect switch.

Through a 13.8kV generator circuit breaker, the power generated from the STG will feed the 115/69/13.8kV GSU transformer and the other 13.8/4.16kV unit auxiliary transformer. The high voltage winding of this generator step-up transformer will be configured with dual-voltage connections at 115kV and 69kV. With the corresponding disconnect switch, the high voltage bushings will connect to the 115kV and 69kV switchyards respectively. The STG will interface with the 115kV switchyard during normal operation and will be connected to the 69kV switchyard only when the second CTG is down for maintenance.

The WEC Switchyard will consist of both 115kV and 69kV switching facilities. The 115kV switchyard will have four-115kV circuit breakers rated at 40kA. These breakers will be configured in a ring bus scheme. The 115kV-ring bus will interface to the Hilmar-WEC and Walnut-WEC 115kV lines using a reduced-tension dead-end take-off structure. The 69kV switchyard will be a four-breaker ring bus configuration. The 69kV-ring bus will intertie to the Walnut-WEC and Industrial-WEC 69kV power lines. The 69kV lines will exit the switchyard from a reduced-tension dead-end take-off structure.

In addition to the two-13.8/4.16kV unit auxiliary transformers, a 12/4.16kV standby auxiliary transformer will be served from the existing TID distribution system. These three auxiliary transformers will feed the 4.16kV switchgear providing power to the WEC project.

The proposed switchyard layout is in accordance with the industry standards and is considered acceptable by staff.

TRANSMISSION FACILITIES

The WEC project will interface to TID electrical transmission system via new 115kV and 69kV power lines. Both 115kV and 69kV lines will be looped to the respective switchyard in the WEC facility. At the 69kV level, this will be done by intercepting the Walnut-Industrial 69kV Line 2 and by installing a double-circuit line to the 69kV switchyard. The new double-circuit 69kV line will be approximately 670 feet long from the tap to the switchyard. The new 69kV poles will be designed for installation of a

12kV-underbuilt distribution line. From the point of interception, one of the existing 69kV lines (Walnut-WEC 69kV Line) proceeds approximately 4,500 feet to Walnut Substation.The other existing line (WEC-Industrial 69kV Line) terminates approximately six miles to Industrial Substation.

At the 115kV level, the power line loop will be executed by intercepting the Walnut-Hilmar 115kV Line and by constructing a double-circuit line to the 115kV switchyard. The new double-circuit 115kV line will be approximately 1,950 feet in length from the point of interconnection to the switchyard. The new 115kV poles will be configured to accommodate the mounting of 12kV-underbuilt distribution line. From the intersection, one of the existing 115kV lines (Walnut-WEC 115kV Line) traverses approximately 750 feet to terminate in the Walnut Substation. The other existing line (WEC-Hilmar 115kV Line) extends approximately six miles to connect in the Hilmar Substation.

For auxiliary plant power, the existing 12kV system will be extended to the WEC facility. The 12kV-underbuilt distribution line will be installed on either the new 69kV or 115kV poles as previously stated.

The transmission and distribution facility configurations are in accordance with good utility practices and are considered acceptable by staff.

ANALYSIS AND IMPACTS

SYSTEM RELIABILITY

A System Impact Study (SIS) for connecting a new power plant to the existing power system grid is performed to determine the alternate and preferred interconnection facilities to the grid, downstream transmission system impacts and their mitigation measures. SIS is conducted in conformance with system performance levels as required in utility reliability criteria, NERC/WECC and Cal-ISO planning standards.

Any new transmission facilities such as the power plant switchyard, the outlet line, and downstream facilities required for reliably connecting a project to the grid are considered to be part of the project and are subject to Energy Commission review.

Scope of System Impact Study (SIS)

The study was performed by Utility System Efficiencies, Inc. (USE) at the request of the TID to identify the transmission system impacts caused by the WEC project on the TID 66/115kV system, the system of the MID and Merced. The SIS included a Power Flow Study, Short Circuit Study, and Dynamic Stability Analysis (TID 2002a, AFC Section 5.4). The study modeled the proposed WEC for a net output of 240MW. The base case included all approved MID, SMUD and City of Merced projects, modeled major transmission system path flows, and the proposed queue of generation projects before the on-line date of the WEC. The detailed study assumptions have been described in the SIS. The grid at the WEC switching station was analyzed using 2006 Heavy Summer and 2006 Heavy Spring base cases under normal (N-0), Cal-ISO Category B (N-1) and Category C (N-2) contingency conditions. The Power Flow study assessed the project's impact on thermal loading of the transmission lines and equipment.

Dynamic stability studies were conducted with the WEC using the 2006 Heavy Summer base case to determine whether the WEC would create instability in the system following certain selected outages. Short circuit studies were conducted with and without the WEC to determine if the WEC would result in overstressing existing substation facilities.

Power Flow Study Results

Based on the SIS results and Ca-ISO testimony, there are no adverse impacts under normal and emergency contingency conditions of the network due to interconnection of the WEC as proposed. The SIS provided a summary of the overload violation under the required criteria (TID 2002a, AFC Section 5.4)

Normal (N-0) Conditions

- The SIS results indicated that no overloads would occur under N-0 conditions in any of the two base cases studied. The addition of the WEC project does not have negative thermal impact on the system under N-0 condition.

Contingency N-1/Cal-ISO Category B Conditions

- The outage of East Altamont Energy Center (EAEC)-Tracy 230kV line #1 overloads the EAEC-Tracy 230kV line #2 by approximately 8.3 percent under the Heavy Summer Cal-ISO contingency condition.
- The outage of EAEC-Tracy 230kV line #2 overloads the EAEC-Tracy 230kV line #1 by approximately 8.3 percent under the Heavy Summer Cal-ISO contingency condition.
- The outage of EAEC-Tracy 230kV line #1 overloads the EAEC-Tracy 230kV line #2 by approximately 10.2 percent under the Heavy Spring Cal-ISO contingency condition.
- The outage of EAEC-Tracy 230kV line #2 overloads the EAEC-Tracy 230kV line #1 by approximately 10.2 percent under the Heavy Spring Cal-ISO contingency condition.

The SIS results conclude that with the exception of above contingencies, the interconnection of the WEC to the TID power system grid does not exacerbate any identified pre-existing system thermal overloads by more than 2 percent, nor does the generation project create any additional reliability criteria violations for Cal-ISO level “B” contingencies.

Contingency N-2/Cal-ISO Category C Conditions

The SIS results conclude that the interconnection of the WEC to the TID power system grid does not exacerbate any identified pre-existing system thermal overloads by more than 2 percent, nor does the generation project create any additional (new) reliability criteria violations for bus section outages.

Mitigation

The pre-existing thermal overload on the EAEC-Tracy 230kV-transmission line(s) is aggravated by the interconnection of WEC. This overload is due to the loss of one of

the planned EAEC-Tracy 230kV transmission lines.TID proposed three options for mitigation to include:

1. Reconductor

   This alternative involves two processes as follows;

   - Step 1 – Coordinate with Calpine to ensure that the installed conductors for the EAEC outlet lines intercepting the Tracy-Westley 230kV transmission lines have sufficient capacity.
   - Step 2 – Reconductor the line segments between Tracy Substation and the EAEC outlet lines ensuring sufficient capacity.

2. Re-rate of transmission facility

   Coordinate with MID and Western Area Power Authority (WAPA) to conduct re-rate analysis. This is to assess the feasibility of using the emergency rating for the EAEC-Tracy 230kV transmission lines.

3. Coordinated operation

   This alternative entails the establishment of a coordinated path flow monitoring system and operating procedures for both EAEC and WEC.

Based on the suggested mitigation measures, TID must select which of the three options will be implemented. Selected mitigation measure must be coordinated with the impacted utilities.

Transient Stability Study Results

Dynamic Stability studies were conducted by TID for the WEC using 2006 Heavy Summer and 2006 Heavy Spring base cases. This is to determine if WEC would create any adverse impact on the stable operation of the transmission grid following selected Cal-ISO category B (N-1) & C (N-2) outages. Transient stability simulations were run for a ten-second duration, which was determined to be suitable to assess system performance and damping. The results indicate that the interconnection of WEC to the TID power systems will not cause system instability. All simulations showed positive damping and were within the WECC Disturbance-Performance criteria. Hard copies of the transient stability plots should be submitted to staff to analyze simulation results and to validate the conclusion.

Post-Transient Study Results

In the TID November 2002 SIS, post-transient analysis was limited to the 500kV bulk system contingencies for N-1 and N-2 conditions. The interconnection of WEC to the TID power systems does not create any post-transient voltage violations or deviations. The addition of the WEC would provide additional dynamic reactive support to the system.

Short Circuit Study Results

Relative to the proposed construction of WEC project, short circuit studies were performed to determine fault current increases in the TID system and the adjacent utility power systems. Three-phase (3-Ph) and line-to-ground (L-G) fault conditions were

simulated. The following table shows the maximum fault currents at the buses studied with and without the WEC project (TID 2002a, AFC Section 5.4).

Location		Pre-Project		Post-Project	
Substation	Voltage	3-Ph	L-G	3-Ph	L-G
Oakdale	115kV	8,553	6,316	9,104	6,509
Westley	230kV	20,116	13,300	20,990	13,549

The short circuit interrupting rating of the power circuit breakers in the 115kV and 69kV systems is 40,000 amperes. The circuit breakers at both Oakdale and Westley Substations are also rated at 40,000 amperes. The rated fault duty is well above the calculated short circuit currents at three-phase and line-to-ground fault conditions and no impacts occur.

COMPLIANCE WITH LORS

The SIS complies with the NERC/WSCC, Cal-ISO and NERC planning Standards and reliability criteria assuming that the SIS was coordinated with and accepted by the adjacent utilities. Staff is still awaiting the confirmation of the SIS and the identified mitigation measures from MID, City of Merced, PG&E, SMUD and WAPA.

The proposed WEC project incorporates transmission lines, substation, switchyard and power plant facilities involving underground and overhead installation. The applicant will design, build and/or operate the proposed facilities according the provisions of GO 95 and 128 or the NESC, Title 8, NEC, applicable interconnection and related industry standards.

FACILITY CLOSURE

Planned closure occurs in a designed and orderly manner for instance at the end of its useful economic or mechanical life or due to gradual obsolescence. Under these conditions, the owner is required to provide a plan 12 months prior to closure. The planned closure will be in conformance with all applicable LORS and will be adequate to provide safety and system reliability. For example, a planned closure provides time for TID to avert the STG, CTGs and their respective GSU transformers from being energized through the switchyard. Alternatively, TID may maintain power service using the switchyard to supply critical station service equipment or other loads.

Unexpected temporary closure occurs when the facility is closed suddenly for a short term due to unforeseen situations such as a natural or other disaster or emergency. During these situations the facility cannot insert power into the utility system. Establishing an on-site contingency plan can accommodate the unexpected temporary closure (Condition of Certification **TSE-5**, f), ii) Executed Facility Interconnection Agreement).

Unexpected permanent closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. The owner remains accountable for implementing the on-site contingency plan. It also includes unexpected closure where

the owner is unable to implement the contingency plan and the project is essentially abandoned. An on-site contingency plan will be developed to assure safety and reliability (**TSE-5**, f) ii) Executed Facility Interconnection Agreement). This plan will be approved by the Energy Commission's Compliance Project Manager (CPM) prior to the beginning of commercial operation of the facility.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No agency or public comments related to the TSE discipline have been received.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Assuming that all pre-existing overload conditions are corrected, and the adjacent utilities accept the SIS and the proposed post-WEC mitigation measures, staff concludes as follows:

1. At N-0 condition the load flow analysis identifies no overloading, voltage drop violation or generation congestion. The stability studies indicated that the WEC project has no adverse impact on system stability.
2. At N-1 condition the interconnection of the WEC to the TID power system grid does not exacerbate any identified pre-existing system thermal overloads by more than 2 percent.
3. The three-phase short circuit duty analysis indicated that the WEC project marginally increases the pre-project short circuit duty but within the breaker interrupting capacity.
4. The addition of WEC and related transmission lines will increase operator flexibility during steady state and contingency conditions.
5. .Post transient analysis identified no voltage criteria violation.

RECOMMENDATIONS

Staff has requested verification of the SIS assumptions, power flow analysis and proposed mitigation measures from MID and the City of Merced. If this information is verified and accepted by the adjacent utilities, staff recommends that the commission adopt the following conditions of certification.

CONDITIONS OF CERTIFICATION FOR TSE

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

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 construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report. [3/12/03]

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Grounding System

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq., require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

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. 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. 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.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; 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. [3/12/03]

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action. (1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required to obtain the CBO's approval. [3/12/03]

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

a) receipt or delay of major electrical equipment;

b) testing or energization of major electrical equipment; and

c) 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 construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report. [3/12/03]

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

a) The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", Cal-ISO standards, National Electric Code (NEC) and related industry standards.

b) Breakers and busses in the power plan switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

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 the project.

e) Termination facilities shall comply with applicable SGD&E interconnection standards.

f) The project owner shall provide to the CPM:

   i) The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing if applicable,

   ii) Executed project owner and Cal-ISO Facility Interconnection Agreement

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lessor number of days mutually agree to by the project owner and CBO, the project owner shall submit to the CBO for approval:

a) Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation

method(s), a sample calculation based on "worst case conditions"[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", NEC, applicable interconnection standards, and related industry standards.

c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.

d) The final DFS, including a description of facility upgrades, operational mitigation measures, and/or SPS sequencing and timing if applicable, shall be provided concurrently to the CPM. [3/12/03]

TSE-6 The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements **TSE-5** a) through f), and have not received CPM and CBO 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 CBO and the CPM.

Verification: At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to requirements of **TSE-5** and request approval to implement such changes. [3/12/03]

TSE-7 The project owner shall provide the following Notice to the California Independent System Operator (Cal-ISO) prior to synchronizing the facility with the California Transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the Cal-ISO a letter stating the proposed date of synchronization; and
2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the Cal-ISO letter to the CPM when it is sent to the Cal-ISO one week prior to initial synchronization with the grid. The project owner shall contact the Cal-ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the Cal-ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time. [3/12/03]

[1] Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO 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 and CBO:

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 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.

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 or acceptable alternative verification. "As built" drawings of the electrical, 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".

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 cha

REFERENCES

Cal-ISO (California Independent System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

Cal-ISO (California Independent System Operator). 1998b. Cal-ISO Dispatch Protocol posted April 1998.

Cal-ISO (California Independent System Operator). 2002a. Cal-ISO Grid Planning Standards, February 2002.

NERC/WECC (North American Reliability Council /Western Electricity Coordinating Council), 2002. NERC/WSCC Planning Standards, August 2002.

TID (Turlock Irrigation District). 2002a, System Impact Study, Walnut Energy Center. Submitted to the California Energy Commission, November 2002.

TID (Turlock Irrigation District). 2002b, Application for Certification, Walnut Energy Center (02-AFC-4). Submitted to the California Energy Commission, November 2002.

DEFINITION OF TERMS

AAC All Aluminum conductor.
ACSR Aluminum Conductor Steel-Reinforced.
SSAC Steel-Supported Aluminum Conductor.
Ampacity Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere The unit of current flowing in a conductor.
Bundled Two wires, 18 inches apart.
Bus Conductors that serve as a common connection for two or more circuits.
Conductor The part of the transmission line (the wire) that carries the current.
Congestion Management

Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports) will not violate criteria.

Emergency Overload

See Single Contingency. This is also called an L-1.

Kcmil or KCM

Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.

Kilovolt (kV)

A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.

Loop An electrical cul de sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.
Megavar One megavolt ampere reactive.
Megavars Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA)

A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW)

A unit of power equivalent to 1,341 horsepower.

Normal Operation/ Normal Overload

When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 Condition

See Single Contingency.

Outlet Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Flow Analysis

A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

Reactive Power

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial Action Scheme (RAS)

A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6 Sulfur hexafluoride is an insulating medium.

Single Contingency

Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable

Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

Switchyard A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating See ampacity.

TSE Transmission System Engineering.

Tap A transmission configuration creating an interconnection through a sort single circuit to a small or medium sized load or a generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

Undercrossing

A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Bob Eller

INTRODUCTION

This section considers potential alternatives to the construction and operation of Turlock Irrigation District's (TID) proposed Walnut Energy Center (WEC) project. The purpose of this alternatives analysis is to comply with California's environmental laws by providing an analysis of a reasonable range of feasible alternatives that could reduce or avoid any potentially significant adverse impacts of the proposed project (Cal. Code Regs., tit. 14, §15126.6; Cal. Code Regs., tit. 20, §1765). In this Alternatives analysis, staff has analyzed different technologies and alternative sites that may reduce or avoid the identified significant impacts.

The purpose of staff's alternatives analysis is to provide a reasonable range of feasible alternatives that could substantially reduce or avoid any potentially significant adverse impacts of the proposed project. To accomplish this, staff must determine the appropriate scope of analysis. Consequently, it is necessary to identify and determine the potentially significant impacts of the proposed project and then focus on alternatives that are capable of reducing or avoiding the significant impacts of the proposed project. To prepare this alternatives analysis, staff:

- identified the basic objectives of the project, provided an overview of the project, and described its potentially significant adverse impacts;
- identified and evaluated alternative sites (whether the alternative site mitigates the identified impacts of the proposed project and whether the alternative site creates impacts of its own);
- identified and evaluated technology alternatives to the project, including conservation and other renewable sources; and
- evaluated the impacts of not constructing the project, known as the No Project Alternative under CEQA.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulations Section 15126.6(a), provide direction by requiring an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." In addition, the analysis must address the No Project Alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

The range of alternatives is governed by the "rule of reason" which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. The California Environmental Quality Act (CEQA) states that an environmental document does not have to consider an alternative if its effect cannot be reasonably ascertained and if its implementation is remote and speculative (Cal.

Code Regs., tit. 14, §15125(d)(5)). However, if the range of alternatives is defined too narrowly, the analysis may be inadequate (City of Santee v. County of San Diego (4th Dist. 1989) 214 Cal. App. 3d 1438).

SITE SELECTION AND PROJECT OBJECTIVES

The site selection criteria listed below were used by the applicant for choosing the proposed site. According to the AFC, the applicant used the following criteria in choosing the proposed site (TID, § 9.0, p 9-3. 2002a). Staff believes these criteria are appropriate for a screening level analysis of site alternatives.

- To safely construct and operate a nominal 250-MW, natural-gas-fired, combined-cycle generating facility within the TID service territory.
- To provide additional generation to meet TID's growing load and meet the demands of customers within 200+ square miles of PG&E's service territory. This service territory acquisition is presently before the California Public Utility Commission (CPUC).
- To provide additional generation within TID to replace the expiration of significant long-term power purchase agreements.
- To increase the possibility of TID becoming a control area, or joining a different control area, both of which would require TID to have additional generation.
- To assist the State of California (State) in developing increased local generation projects, thus reducing dependence on imported power.
- To contribute to the diversification of the County's economic base by providing increased employment opportunities and a reliable power supply.

ANALYSIS OF ALTERNATIVE SITES

For TID, staff has determined that significant air quality impacts may occur from the construction of the project (Air Quality) and from the release of anhydrous ammonia used as a catalyst to reduce air emissions from the project (Hazardous Materials Management). In addition, staff found that the project will require additional mitigation for the conversion of agricultural land to industrial use (Land Use), will cause noise impacts to nearby residents (Noise), will use groundwater for an interim period until reclaimed water is available (Soil and Water Resources), and will require additional screening during construction (Visual Resources). Staff has proposed mitigation in this PSA which reduces the expected impacts of the proposed project to an insignificant level.

PROPOSED SITE

The Walnut Energy Center is located at the western edge of Turlock, approximately 2.7 miles west of Highway 99, just south of West Main Avenue (J17). This site consists of approximately 18 acres within a 69-acre parcel of industrially zoned agricultural land with industrial development on the north and east sides. Agricultural uses are located south of the site and agricultural, residential, and utility uses are to the west.

The site is adjacent to a 115-kV transmission line that connects to the existing Walnut peaking plant and substation. The existing switchyard has sufficient transmission capacity to serve a new 250-MW plant. Natural gas would be supplied to the new power plant from the PG&E main on Bradbury Road. Additional compression would be necessary to serve the new plant. Water supply for the cooling towers would be obtained from the Turlock Wastewater Treatment Plant (WWTP), located about three miles east. Effluent from the plant would be treated using a zero-liquid-discharge (ZLD) system.

The site is being acquired by TID and was selected, according to the applicant, to meet most of the previously identified objectives of the project (TID 2002a).

ALTERNATIVE SITES

TID also identified and assessed the suitability of several other properties for WEC. As part of this assessment, properties that were less than eight acres in size were eliminated from further consideration because of their inability to support the project's space requirements.

Five potential sites that have sufficient land available were identified by the applicant. **Alternatives Figure 1** show the location of the alternative sites that were potentially suitable for construction of WEC.

Alternative Site Selection Criteria

The criteria developed by the applicant to evaluate the alternative sites' suitability for WEC correspond with the reasons the proposed site was selected. These criteria include the following:

- ability to gain site control;
- availability of sufficient land area;
- proximity to existing transmission and distribution lines and close to an existing substation;
- proximity to recycled water supply;
- proximity to PG&E main gas pipeline;
- adjacent to a rail line to facilitate rail delivery of heavy equipment;
- consistency with the City and County General Plans and zoning ordinances, height restrictions, and existing land uses;
- the ability, with implementation of reasonable mitigation measures, to have a less-than-significant impact on the environment;
- location in area appropriate for industrial development; and
- location within TID's service territory

The alternative site locations, shown in **Alternatives Figure 1** were evaluated by the applicant using the above criteria. The site characteristics are summarized in **Alternatives Table 1**.

Alternatives Table 1 **Comparison Using Site Selection Criteria**					
Alternative Site	Site Size (acres)	Land Use Compatibility	Available Linear Facilities[a]	Environmental Sensitivity	Distance to Residential
Walnut Energy Center (proposed site)	18	zoned: Industrial; currently farmed	W: 1.6 miles G:3.6 miles T: 115 kV-0.4 mi; 69 kV-650 ft	Low	3 homes 375 to 2,000 ft.
Washington Road	40	Zoned: AG-2-40; currently farmed	W: 2 miles G:3.2 miles T: 115 kV-0.1 mi; 69 kV-0.1 mi	Low	3 homes at 775 feet; 6 within 2,000 feet
Almond Power Plant	10	Zoned: Community Facility; currently farmed	W: 0.5 mile G: < 0.1 mile T: 5 miles	Low	1 home 2,000 ft.; Subdivision at 3,700 ft
Chemurgic	20	Zoned: AG-2-40; Industrial uses	W: 0.5 mile G: 0.5 mile T: 0.1 mile	Low	2 homes 1,000 ft.
Modesto WWTP	8	Zoned: AG-2-40; currently fallow (i.e., road material storage)	W: 1 mile G: 6 miles T: 5 miles	High	2 homes 1,000 ft.

Notes:
[a] W: = recycled water; G: = natural gas; T= transmission.

Source: TID 2002a; Table 9.3-1

Alternative Site Description

Washington Road Site

The Washington Road site would be situated on a 40-acre site (one 20-acre parcel and two 10-acre parcels that would be combined) located south of the Tidewater Southern Railroad (TSRR) tracks and the existing Walnut peaking plant on the west site of Washington Road, just south of West Main Avenue and due west of the proposed site.

Alternative Figure 1 goes here……..

Agricultural uses are located south, east, and west of the site, with utility uses to the north. The site is located in Stanislaus County and is zoned for agricultural use. A power plant would be consistent with the zoning.

The site is adjacent to a major 115-kV transmission line that connects to the existing Walnut peaking plant and substation. The existing switchyard has sufficient transmission capacity to serve a new 250-MW plant. Natural gas would be supplied to the new power plant from the PG&E main on Bradbury Road. Additional compression would be necessary to serve the new plant. Water supply for the cooling towers would be obtained from the Turlock WWTP, located about 2 miles east. Effluent from the plant would be treated using a ZLD system.

The facility would be located near an industrial area of the City of Turlock that has several tall industrial structures within the context of mixed residential and industrial uses. There are two residences located on the 40-acre Washington Road site. Assuming that the residences on the two parcels that would need to be acquired are removed, the nearest residential uses to the project, which are potentially sensitive noise receptors, are located less than 0.2 mile south of the project. There are up to six other residential receptors within 0.4 mile. (TID 2002a)

Almond Power Plant

The Almond Power Plant site is located on the southern edge of Ceres, about 4.4 miles south of the center of the City of Modesto, 2.2 miles west of Highway 99. The site is a 10-acre parcel of flat land, used primarily for row crops. A 230-kV transmission line crosses the south section of the property. The site is zoned Community Facilities. This zoning designation allows power plants, but may require a conditional use permit from the City of Ceres.

The nearest electric interconnection line is at the existing Almond power plant switchyard, located less than 0.2 mile east of the site. The Almond power plant is served by a 69-kV line. The nearby 230-kV line does not have sufficient capacity to serve a 250-MW plant. Therefore, the Almond power plant does not have the capacity to support the proposed facility. Natural gas delivery would require a short new line connecting to the supply at the Almond power plant. PG&E system improvements would also be required. Existing compression and capacity is not sufficient to support the power plant. Water supply would be obtained from the Ceres WWTP, located 0.5 mile east of Almond power plant. This water is only secondary treated and not Title 22-compliant. Recycled water would be conveyed via a new 0.5-mile-long pipeline running primarily under and adjacent to existing irrigation canals. Effluent from the plant might be returned to the wastewater plant by agreement with the City, or disposed through ZLD.

Property surrounding the site is currently in agricultural use. However, the land to the north and west has recently been purchased and, therefore, may not be available for purchase by TID. Commercial and residential developments occur along Crow's Landing Road (0.5 mile to the west) and East Service Road (about 0.5 mile to the north). A residential subdivision is located just over 0.5 mile to the northeast at Morgan Road and East Service Road. The facility would be visible in nearly all directions within

the context of mixed residential and industrial uses in the area. The residential uses nearest to the project, which are potentially sensitive noise receptors, are located 2,000 feet from the site to the west on Crows Landing Road. (TID 2002a)

Chemurgic Site

The Chemurgic site is located at 3106 South Faith Home Road, at the corner of Faith Home Road and Harding Avenue, four miles southwest of Turlock. The site is 38 acres, of which approximately 20 acres are currently used by Chemurgic Agricultural Chemicals, Inc. to produce pesticides and fertilizer products. In addition to the Chemurgic facilities, there is one tenant (a low-level radioactive waste hauler) located along the northwestern corner of the site. The rest of the site is unused. The site was formerly called the Turlock CWS Plant, acquired in 1945 and used for incendiary oil bomb filling, flare testing, and storage. Chemurgic Corporation operated a chemical manufacturing plant on the site from 1949 through 1961. In 1995, Chemurgic submitted an integrated cleanup plan. The primary contaminant is gamma BHC (Lindane), which is an insecticide. A soil treatment program was completed in the fall of 1995, removing an estimated 95 percent of the source chemicals onsite. Currently, two extraction wells operate onsite and groundwater is treated using an activated carbon adsorption treatment plant and an infiltration trench. Groundwater cleanup is in the final phase of the remedial program. The site contains some original buildings from its WWII operations.

The site is in unincorporated Stanislaus County and surrounded by almond orchards, alfalfa and hay fields, and sparse rural residential units. The site proposed for the power plant would be located in the eastern portion of the site. The site is zoned for PD 81 (Planned Development). A power plant would be consistent with the PD zoning, but would require an approved development plan.

The closest transmission line to the Chemurgic site would be a proposed 115-kV line along West Harding Road and would have sufficient capacity to handle the plant's output.

Water for this site would come from the Turlock WWTP located at Linwood Avenue and Walnut approximately four miles away. However, recycled water from the WWTP would be supplied via an existing outfall that transports the treated wastewater to the Harding drain. This pipeline is located about 0.5 mile from the proposed site. Effluent from the power plant would be disposed with a ZLD system. A TID transmission lines project is planned to run along Harding Road less than 0.1 mile from the site.

Natural gas would come from Washington Road, approximately 0.5 miles away, but might require a compressor station at the plant to provide sufficient pressure. Roads are adequate for heavy traffic and there is a functional rail spur to the facility to deliver heavy equipment. (TID 2002a)

Modesto WWTP Site

The Modesto WWTP site is located 100 yards southwest of the corner of Fulkerth and Vivian Road, 8.4 miles southwest of Ceres. The site is approximately eight acres of "high ground" elevated above the surrounding area. To the south and west, the fields of

alfalfa are irrigated with wastewater and drain to an unnamed meandering channel that is also south of the site. The soils on the elevated portion are whitish and are reported to be alkaline and salty, and therefore, undesirable for planting. The drainage canal immediately to the south is 20 feet wide in places, and supports a lush growth of dense bulrushes, and willow scrub. The site is in unincorporated Stanislaus County and currently zoned and used for agriculture. A power plant would be consistent with the zoning, but would require a use permit.

Water for this site would come from the Modesto Wastewater Treatment Plant located approximately one mile north of the site. Wastewater would be returned to the Modesto WWTP or treated with a ZLD system.

The closest transmission line is a 115-kV line located approximately five miles away. It has sufficient capacity to handle the plant's output, but would require five miles of new line for connection. Natural gas would come from Bradbury Road, six miles to the south. Roads may need to be improved to be adequate for heavy traffic. (TID 2002a)

Conclusion Regarding Alternative Sites

Staff has evaluated the alternative sites proposed by the applicant and finds that the alternative sites would have similar impacts to those identified at the proposed site and, in some cases, additional impacts due to the proximity of residences or an increased length of linear facilities.

Staff believes that, if the mitigation identified by staff in this PSA is implemented, the impacts of the construction and operation of the WEC, at the proposed site, can be mitigated to an insignificant level. Some of this additional mitigation will require discussion with the applicant during our PSA workshops. In the event staff cannot reach agreement with the applicant on the proposed mitigation we will provide additional alternative sites for evaluation in the Final Staff Assessment (FSA).

NO PROJECT ALTERNATIVE

The No Project Alternative under CEQA assumes that the WEC project is not constructed. In the CEQA analysis, the No Project Alternative is compared to the proposed project and determined to be superior, equivalent, or inferior to it. The CEQA Guidelines state that "the purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project" (Cal. Code Regs., tit. §15126.6(i)). Toward that end, the No Project analysis considers "existing conditions" and "what would be reasonably expected to occur in the foreseeable future if the project were not approved…" (§15126.6(e)(2)).

If the WEC facility were not constructed, the proposed site would likely continue to be leased for agricultural production. Fresh water use for irrigating the agricultural land would continue to be higher than that needed to support the WEC since it the proposed facility uses reclaimed water. However, if the WEC was not constructed, it would not contribute to California's electricity resources, increase competition, and help form a more reliable electric system that meets the goals of the deregulated energy market.

Due to market forces, the proposed facility may also serve to reduce reliance on older, less efficient, gas-fired energy facilities.

ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

This section describes alternatives that did not satisfy the screening criteria for inclusion in a more detailed analysis, and include the following:

- simple or combined-cycle gas-fired plant
- demand side management;
- distributed generation; and
- other renewable resources.

These alternatives, and the reasons for their not being considered in detail in this analysis, are addressed below.

TECHNOLOGY ALTERNATIVES

Conservation and Demand-Side Management

Conservation and demand-side management (DSM) include a variety of approaches, including energy efficiency and conservation, building and appliance standards, load management and fuel substitution. Public Resources Code Section 25305(c) states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission's energy forecasts and shall not be considered as alternatives to a proposed facility during the siting process. The forecast that addresses this issue is the Energy Commission's California Energy Outlook. Thus, such alternatives are not included in this analysis.

Since 1975, the displaced peak demand from all of these efforts has been roughly the equivalent of eighteen 500-MW power plants. At a state level, the annual impact of building and appliance standards has increased steadily, from 600 MW in 1980 to 5,400 MW in 2000, as more new buildings and homes are built under increasingly efficient standards. Savings from energy efficiency programs implemented by utilities and state agencies have also increased (from 750 MW to 3,300 MW). Recent demand reducing proposals from the Governor and Legislature have proven to have an impact by reducing consumption by an average of 3,500 MW during the summer of 2001 (CEC 2001a). In addition, voluntary conservation measures adopted by residential and commercial/industrial users led to a 7.5 percent drop in electricity use throughout the state as of August 2001, but that dropped to 1.5 percent in October 2001 (CEC 2001a). There was a 0.7 percent increase in energy used in February 2002 compared to February 2001 (CEC 2002). However, in comparison to February 2000, there was a 5.5 percent decrease in energy consumption in February 2002 (CEC 2002).

GENERATION TECHNOLOGY ALTERNATIVES

Staff considered several alternative generation technologies including a plant that burns fossil fuels: solar, wind, biomass, and hydropower.

Solar Generation

There are two types of solar generation: solar thermal power and photovoltaic (PV) power generation.

Solar thermal power generation involves the conversion of solar radiation to thermal energy, which is then used to run a conventional steam power system. Solar thermal is a viable alternative to conventional generation systems and, depending on the technology, is suited to either distributed generation on the kW scale or to centralized power generation on scales up to several hundred MW. Solar thermal systems utilize three designs to generate electricity: parabolic trough concentrating collectors, power tower/heliostat configurations, and parabolic dish collectors. Parabolic trough and power tower systems typically run conventional power units, such as steam turbines, while parabolic dish systems power a small engine at the focal point of the collector.

PV power generation involves the direct conversion of light to electricity. PV is best suited to distributed generation uses rather than centralized power generation. PV is the most capital intensive of any alternative generation technology (Aspen 2001). PV power systems consist of solar electric modules (built from PV cells) assembled into arrays of varying sizes to produce electric power proportional to the area of the array and the intensity of the sunlight. PV arrays can be mounted on either the ground or on buildings. They can be installed on dual-purpose structures such as covered parking lots.

Solar resources would require large land areas in order to generate 200 MW of electricity. Specifically, assuming location in an area receiving maximum solar exposure such as the desert areas of California, central receiver solar thermal projects require approximately five acres per MW, so 250 MW would require approximately 1,250 acres. One square kilometer of PV generation (400 acres) can produce 100 MW of power, so 250 MW would require approximately 850 acres. Either of these technologies would use significantly more land area than the 16 acres required for the proposed WEC.

Although air emissions are significantly reduced or eliminated for solar facilities, these facilities can have significant visual effects. Solar generation results in the absence or reduction in air pollutant emissions, and visible plumes. Water consumption for solar generation is substantially less than for a geothermal or natural gas fired plant because there is no thermal cooling requirement. In addition, the large avian populations, migratory bird pathways, and relatively large populations of threatened or endangered birds in an area would require careful analysis of potential impacts from either solar or PV generation at scale.

Like all technologies generating power for sale into the state's power grid, solar thermal facilities and PV generation require near access to transmission lines. Large solar thermal plants must be located in desert areas with high direct normal insolation, and in these remote areas, transmission availability is limited. Additionally, solar energy technologies cannot provide full-time availability due to the natural intermittent availability of sunlight. Therefore, solar thermal power and photovoltaic power generation would not successfully meet the project objectives.

Wind Generation

Wind carries kinetic energy that can be used to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40 percent of the wind's kinetic energy into electricity. Modern wind turbines represent viable alternatives to large bulk power fossil power plants as well as small-scale distributed systems. The range of capacity for an individual wind turbine today ranges from 400 watts up to 3.6 MW. California's 1,700 MW of wind power represents 1.5 percent of the state's electrical capacity (Aspen 2001).

Although air emissions are significantly reduced or eliminated for wind facilities, these facilities can have significant visual effects. Wind turbines have also caused bird mortality (especially for raptors) resulting from collision with rotating blades although this effect is more noted in the Altamont Pass area than in other parts of the state.

Wind resources require large land areas in order to generate 250 MW of electricity. Depending on the size of the wind turbines, wind generation "farms" generally can require between five and 17 acres to generate one megawatt (CEC 2001b). A 200 MW plant would therefore require between 1,250 and 4,200 acres. Although 7,000 MW of new power wind capacity could cost-effectively be added to California's power supply, the lack of available transmission access is an important barrier to wind power development (Beck et al. 2001). California has a diversity of existing and potential wind resource regions that are near load centers such as San Francisco, Los Angeles, San Diego and Sacramento (CEC 2001c). However, wind energy technologies cannot provide full-time availability due to the natural intermittent availability of wind resources. Therefore, wind generation technology would not meet the project's goal, which is to provide load-serving capacity.

Biomass Generation

Biomass generation uses a waste vegetation fuel source such as wood chips (the preferred source) or agricultural waste. The fuel is burned to generate steam. Biomass facilities generate substantially greater quantities of air pollutant emissions than natural gas burning facilities. In addition, biomass plants are typically sized to generate less than 20 MW, which is substantially less than the capacity of the 250 MW TID project. At the peak of the biomass industry, 66 biomass plants were in operation in California, but as of 2001, only about 30 direct-combustion biomass facilities were in operation (CEC 2001d).

In order to generate 250 MW, ten 25 MW biomass facilities would be required. These power plants would have potentially significant environmental impacts of their own.

Hydropower

While hydropower does not require burning fossil fuels and may be available in California, this power source can cause significant environmental impacts, due primarily to the inundation of many acres of potentially valuable habitat and the interference with fish movements during their life cycles. In addition, planning and permitting time is on the order of 10 years. As a result, it is extremely unlikely that new large hydropower

facilities could be developed and permitted in California within the next several years (Aspen 2001).

Conclusion Regarding Alternative Technologies

Alternative generation typically has specific resource needs, environmental impacts, permitting difficulties, and intermittent availability. Therefore, these technologies do not fulfill a basic objective of the proposed project to provide load-serving capability in order to ensure a reliable supply of electricity for Imperial County and California. Consequently, staff does not believe that these renewable technologies present feasible alternatives to the proposed project.

CONCLUSIONS

Staff does not consider alternative technologies (solar, wind, biomass, and hydroelectric) to be feasible alternatives to the proposed project. While the No Project Alternative would eliminate all impacts of this project, including the benefits of increasing in-state generation and increased capacity for Turlock Irrigation District. This would ensure that environmental impacts could be shifted to other power plant locations where impacts could be greater than those that would result from the construction and operation of the WEC.

Staff has evaluated the alternative sites proposed by the applicant and finds that the alternative sites would have similar impacts to those identified at the proposed site and, in some cases, additional impacts due to the proximity of residences or an increased length of linear facilities.

Staff believes that, if the mitigation identified by staff in this PSA is implemented, the impacts of the construction and operation of the WEC, at the proposed site, can be mitigated to an insignificant level. Some of this additional mitigation will require additional discussion with the applicant during our PSA workshops. In the event staff cannot reach agreement with the applicant on the proposed mitigation, we will provide additional alternative sites for evaluation in the Final Staff Assessment (FSA).

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GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Lance Shaw

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in 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 elements that:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions;
- establish requirements for facility closure plans; and
- specify conditions of certification that follow each technical area that 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 assuring that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

DEFINITIONS

To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

Site Mobilization

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for construction utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for

the occupants. Site mobilization is for temporary facilities and is, therefore, not considered construction.

Ground Disturbance

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

Grading

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

Construction

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

a. the installation of environmental monitoring equipment;

b. a soil or geological investigation;

c. a topographical survey;

d. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; or

e. any work to provide access to the site for any of the purposes specified in a., b., c., or d.

Start Of Commercial Operation1

For compliance monitoring purposes, "commercial operation" is that phase of project development which begins after the completion of start-up and commissioning, where the power plant has reached steady-state production of electricity with reliability at the rated capacity. For example, at the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

A Compliance Project Manager (CPM) will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Energy 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

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1 A different definition of "Start of Commercial Operation," may be included in the Air Quality (AQ) section (per District Rules or Federal Regulations). In that event, the definition included in the AQ section would only apply to that section.

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 the approval will involve all appropriate staff and management.

The Energy Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Energy Commission about power plant construction or operation-related questions, complaints or concerns.

Pre-Construction and Pre-Operation Compliance Meeting

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

Energy Commission Record

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

- all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
- all monthly and annual compliance reports filed by the project owner;
- all complaints of noncompliance filed with the Energy Commission; and
- all petitions for project or condition changes and the resulting staff or Energy Commission action.

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. A summary of the General Conditions of Certification is included as **Compliance Table 1**

at the conclusion of this section. The designation after each of the following summaries of the General Compliance Conditions (**COM-1, COM-2,** etc.) refers to the specific General Compliance Condition contained in **Compliance Table 1.**

COM-1, Unrestricted 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 files and 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.

COM-2, Compliance Record

The project owner shall maintain project files onsite, or at an alternative site approved by the CPM, for the life of the project unless a lesser period of time is specified by the conditions of certification. The files shall contain copies of all "as-built" drawings, all documents submitted as verification for conditions, and all other project-related documents.

COM-3, Compliance Verification Submittals

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.

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. providing appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or
4. Energy Commission staff inspections of mitigation or other evidence of mitigation.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal**. The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification 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
Docket Number
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.

COM-4, Pre-Construction Matrix and Tasks Prior to Start of Construction

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, and shall be submitted prior to the first pre-construction meeting, if one is held. It will be in the same format as the compliance matrix referenced below. Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times (e.g., 30, 60, 90 days) for submittal of compliance verification documents to the CPM for conditions of certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project construction.

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.
It is important that the project owner understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change based upon the Final Decision

COMPLIANCE REPORTING

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

COM-5, Compliance Matrix

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable;
7. the compliance status of each condition (e.g., “not started,” “in progress” or “completed” (include the date); and
8. the project’s preconstruction and construction milestones, including dates and status (if milestones are required).

Satisfied conditions do not need to be included in the compliance matrix after they have been identified as satisfied in at least one monthly or annual compliance report.

COM-6, Monthly Compliance Report

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the **Key Events List. The Key Events List form is found at the end of this section.**

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies (or amount specified by Compliance Project Manager) of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification;
4. a list of conditions that have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;

5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. a listing of the month's additions to the on-site compliance file;
10. any requests, with justification, to dispose of items that are required to be maintained in the project owner's compliance file; and
11. a listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolutions of any resolved complaints, and the status of any unresolved complaints.

COM-7, Annual Compliance Report

After construction is complete, 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;
9. an evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section]; and

10. a listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved complaints, and the status of any unresolved complaints.

COM-8, Construction and Operation Security Plan

Thirty days prior to commencing construction, a site-specific Security Plan for the construction phase shall be developed and maintained at the project site. At least 60 days prior to the initial receipt of hazardous materials on-site, a site-specific Security Plan and Vulnerability Assessment for the operational phase shall be developed and maintained at the project site. The project owner shall notify the CPM in writing that the Plan is available for review and approval at the project site.

Construction Security Plan

The Construction Security Plan must address:

1. site fencing enclosing the construction area;
2. use of security guards;
3. check-in procedure or tag system for construction personnel and visitors;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
5. evacuation procedures.

Operation Security Plan

The Operations Security Plan must address:

1. permanent site fencing and security gate;
2. use of security guards;
3. security alarm for critical structures;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. evacuation procedures;
6. perimeter breach detectors and on-site motion detectors;
7. video or still camera monitoring system;
8. fire alarm monitoring system;
9. site personnel background checks [Site personnel background checks are limited to ascertaining that the employee's claims of identity and employment history are accurate. All site personnel background checks must be consistent with state and federal law regarding security and privacy.]; and
10. site access for vendors and requirements for Hazardous Materials vendors to conduct personnel background security checks [Site access for vendors must be strictly controlled. Consistent with recent state and current federal regulations governing the transport of hazardous materials, hazardous materials vendors will have to maintain their transport vehicle fleet and employ only drivers properly licensed and trained. The project owner is required, through the use of contractual

language with vendors, to ensure that vendors supplying hazardous materials conduct personnel background checks on any employee involved in the transportation and delivery of hazardous materials to the power plant. All vendor related personnel background checks will be consistent with site personnel background checks, as per above, including state and federal law regarding security and privacy.].

In addition, in order to determine the level of security appropriate for this power plant, the project owner shall prepare a Vulnerability Assessment and implement site security measures addressing hazardous materials storage and transportation consistent with US EPA and US Department of Justice guidelines [Chemical Vulnerability Assessment Methodology (July 2002)]. The level of security to be implemented is a function of the likelihood of an adversary attack, the likelihood of adversary success in causing a catastrophic event, and the severity of consequences of that event. This Vulnerability Assessment will be based, in part, on the use and storage of certain quantities of acutely hazardous materials as described by the California Accidental Release Prevention Program (Cal-ARP, Health and Safety Code section 25531). Thus, the results of the off-site consequence analysis prepared as part of the Risk Management Plan (RMP) will be used to determine the severity of consequences of a catastrophic event and hence the level of security measures to be provided.

The CPM may authorize modifications to these measures, or may require additional measures depending on circumstances unique to the facility, and in response to industry-related security concerns.

COM-9, Confidential Information

Any information that 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, that is determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

COM-10, 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 $850. The payment instrument shall be provided to the Energy Commission's Project Manager (PM), not the CPM, at the time of project certification and shall be made payable to the California Department of Fish and Game. The PM 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.

COM-11, 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. All recorded inquiries shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during

construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at:

http://www.energy.ca.gov/sitingcases/power_plants_contacts.html

Any changes to the telephone number shall be submitted immediately to the CPM who will update the web page.

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 (Attachment A).

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 that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

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

CLOSURE DEFINITIONS

Planned Closure

A planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

Unplanned Temporary Closure

An unplanned 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.

Unplanned Permanent Closure

An unplanned permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unplanned closure where the owner remains accountable for implementing the on-site contingency plan. It can also

include unplanned closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

GENERAL CONDITIONS FOR FACILITY CLOSURE

COM-12, Planned Closure

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

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 any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
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.

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 Energy 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 Energy Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Energy Commission approval of the facility closure plan is obtained.

COM-13, Unplanned Temporary Closure/On-Site Contingency Plan

In order to ensure that public health and safety and the environment are protected in the event of an unplanned 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 impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less that 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. (Also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned 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 unplanned temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that an unplanned temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with the requirements for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

COM-14, Unplanned Permanent Closure/On-Site Contingency Plan

The on-site contingency plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned 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 unplanned permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan, consistent with the requirements for a planned closure, shall be developed and submitted to the CPM within 90 days of the permanent closure or another period of time agreed to by the CPM.

CBO DELEGATION AND AGENCY COOPERATION

In performing construction monitoring of the project, Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Commission staff retains CBO authority when selecting a delegate CBO including enforcing and interpreting state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental control when conducting project monitoring.

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 Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider. Moreover, to ensure compliance with the terms and conditions of certification and applicable LORS, 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 the 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 that the Energy Commission 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 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 48 hours, followed by a written report filed within seven 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 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 agencies 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.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Energy Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Cal. Code Regs., tit. 20, §§ 1232-1236).

POST CERTIFICATION CHANGES TO THE ENERGY 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 Energy 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, or 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

As provided in Title 20, Section 1770 (d), California Code of Regulations, a verification may be modified by staff without requesting an amendment to the decision if the change does not conflict with the conditions of certification.

COM-6, KEY EVENTS LIST

PROJECT: Walnut Energy Center **Power Project**

DOCKET #: (02-AFC-4)

COMPLIANCE PROJECT MANAGER: Lance Shaw

EVENT DESCRIPTION	**DATE**
Certification Date/Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
SYNCHRONIZATION WITH GRID AND INTERCONNECTION	
COMPLETE T/L CONSTRUCTION	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	
COMPLETE GAS PIPELINE CONSTRUCTION	
WATER SUPPLY LINE ACTIVITIES	
START WATER SUPPLY LINE CONSTRUCTION	
COMPLETE WATER SUPPLY LINE CONSTRUCTION	

Table 1
Compliance Section
Summary Of General Conditions Of Certification

CONDITION NUMBER	PAGE #	SUBJECT	DESCRIPTION
COM-1	4	Unrestricted Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COM-2	4	Compliance Record	The project owner shall maintain project files on-site. Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COM-3	4	Compliance Verification Submittals	The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether the condition was satisfied by work performed by the project owner or his agent.
COM-4	5	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until all of the following activities/submittals have been completed: ▪ property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns; ▪ a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction; ▪ all pre-construction conditions have been complied with; and ▪ the CPM has issued a letter to the project owner authorizing construction.
COM-5	6	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification.
COM-6	6	Monthly Compliance Report (including a Key Events List)	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List.

CONDITION NUMBER	PAGE #	SUBJECT	DESCRIPTION
COM-7	7	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports.
COM-8	8	Security Plans	Thirty days prior to commencing construction, the project owner shall submit a Security Plan for the construction phase. Sixty days prior to initial receipt of hazardous material on site, the project owner shall submit an Security Plan & Vulnerability Assessment for the operational phase.
COM-9	9	Confidential Information	Any information the project owner deems confidential shall be submitted to the Dockets Unit with an application for confidentiality.
COM-10	9	Dept of Fish and Game Filing Fee	The project owner shall pay a filing fee of $850 at the time of project certification.
COM-11	9	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to the CPM, all notices, complaints, and citations.
COM-12	10	Planned Facility Closure	The project owner shall submit a closure plan to the CPM at least twelve months prior to commencement of a planned closure.
COM-13	11	Unplanned Temporary Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COM-14	12	Unplanned Permanent Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.

ATTACHMENT A

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: Walnut Energy Center **POWER Project** AFC Number: (02-AFC-4)
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 Energy Commission 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.)

WALNUT ENERGY CENTER
PREPARATION TEAM

Executive Summary ..... Bob Eller

Introduction ..... Bob Eller

Project Description ..... Bob Eller

Air Quality ..... Brewster Birdsall

Biological Resources ..... Bruce Barnett and Rick York

Cultural Resources ..... Roger Mason

Hazardous Materials ..... Alvin J. Greenberg, Ph.D. And Rick Tyler

Land Use ..... Amanda Stennick

Noise and Vibration ..... Jim Buntin

Public Health ..... Alvin J. Greenberg, Ph.D.

Socioeconomics ..... James Adams

Soil and Water ..... Joe Crea and Richard Latteri

Traffic and Transportation ..... Steven J. Brown, P.E.

Transmission Line Safety and Nuisance ..... Obed Odoemelam, Ph.D.

Visual Resources ..... Michael Clayton and Will Walters

Waste Management ..... Alvin Greenberg, Ph.D.

Worker Safety and Fire Protection ..... Alvin J. Greenberg, Ph.D. and Rick Tyler

Facility Design ..... Shahab Khoshmashrab, Al McCuen and Steve Baker

Geology and Paleontology ..... Dal Hunter, Ph.D., C.E.G.

Power Plant Efficiency ..... Kevin Robinson and Steve Baker

Power Plant Reliability ..... Kevin Robinson and Steve Baker

Transmission System Engineering ..... Henry Zaininger, Laiping Ng, and Al McCuen

Alternatives ..... Bob Eller

Compliance Monitoring and Facility Closure ..... Connie Bruins

Project Assistant ..... Keith A. Muntz

Support Staff ..... Raquel Rodriguez