Final Staff Assessment

GWF TRACY COMBINED CYCLE POWER PLANT PROJECT

Application For Certification (08-AFC-07)
San Joaquin County

CALIFORNIA ENERGY COMMISSION

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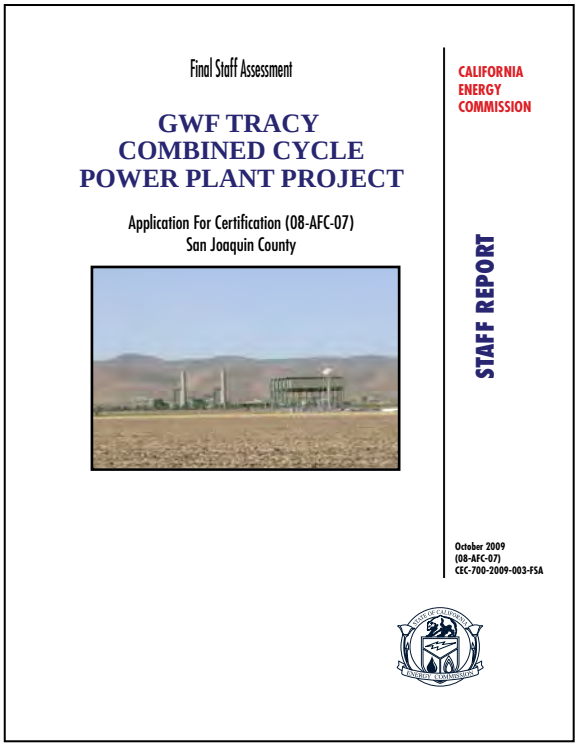

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GWF TRACY COMBINED CYCLE POWER PLANT
(08-AFC-7)
FINAL STAFF ASSESSMENT

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EXECUTIVE SUMMARY

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INTRODUCTION

This Final Staff Assessment (FSA) contains the California Energy Commission staff's independent evaluation of the GWF Tracy Combined-Cycle Power Plant (GWF Tracy) Application for Certification (08-AFC-7). The FSA examines engineering, environmental, public health and safety aspects of the GWF Tracy project, based on the information provided by the applicant, GWF Energy, LLC (GWF) and other sources available at the time the FSA was prepared. The FSA contains analyses similar to those normally contained in an Environmental Impact Report (EIR) required by the California Environmental Quality Act (CEQA). When issuing a license, the Energy Commission is the lead state agency under CEQA, and its process is functionally equivalent to the preparation of an EIR.

The Energy Commission staff has the responsibility to complete an independent assessment of the project's engineering design and its 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 proposes conditions of certification for construction, operation and eventual closure of the project, if approved by the Energy Commission.

This FSA is not the decision document for these proceedings; however, it does serve as staff's formal testimony in evidentiary hearings to be held by the Committee of two Commissioners who are hearing this case. After evidentiary hearings, the Committee will consider the recommendations presented by staff, the applicant, all parties, government agencies, and the public prior to proposing its decision. The full Energy Commission will make the final decision, including findings, after the Committee's publication of its proposed decision.

PROJECT LOCATION AND DESCRIPTION

GWF Energy, LLC's objectives are to convert the existing Tracy Peaker Project (TPP) generation facility to a combined cycle power plant in order to address the future electricity needs of California. Further objectives are to construct and operate an electrical generating facility on an existing brown-field site, provide additional electrical capacity in the San Joaquin County and city of Tracy area, utilize existing TPP infrastructure to reduce environmental impacts and costs, and enhance the reliability of the state's electrical system by providing power generation near the centers of electrical demand.

The proposed project site consists of 16.38 acres within a 40-acre parcel in San Joaquin County, and is located within an industrial and agricultural area which includes the existing TPP. The San Joaquin County General Plan designates the proposed project site as General Agriculture and the County Zoning Designation is G 40, which allows electrical generation.

The project would include the addition of two heat recovery steam generators, a steam turbine generator, an auxiliary boiler, an air-cooled dry condenser unit, and a 115-kilovolt (kV) electrical switchyard. The proposed project would use existing TPP infrastructure, including the existing natural gas pipeline, water supply pipeline, and electric transmission line. Two short segments of PG&E's 115 kV transmission system (totaling approximately 2.3 miles) would require reconductoring (upgraded wires to accommodate the added generating capacity). The reconductoring activity would upgrade two wire segments, approximately 1.6 miles and 0.7 mile long, respectively, near the intersection of Interstate (I-5) and I-205, near the PG&E Kasson Substation. Process water for non-cooling; industrial needs, and potable water for drinking and sanitary needs would be supplied via the existing TPP pipeline from the Delta-Mendota Canal by the Byron Bethany Irrigation District.

If approved, project construction would begin in the fall of 2010, with commercial operation commencing in June 2012.

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 seeks comments from and works closely with other regulatory agencies that administer LORS that may be applicable to proposed projects. These agencies may include as applicable the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, State Water Resources Control Board/Regional Water Quality Control Board, California Department of Fish and Game, and the California Air Resources Board. On August 4, 2008, the Energy Commission staff sent the GWF Tracy AFC to all local, state, and federal agencies that might be affected by the proposed project.

OUTREACH EFFORTS

Energy Commission regulations require staff to send notices regarding receipt of an AFC and Commission events and reports related to proposed projects, at a minimum, to property owners within 1,000 feet of a project and 500 feet of a linear facility (such as transmission lines, gas lines and water lines). This was done for the GWF Tracy project on August 4, 2008.

The Energy Commission's outreach efforts are an ongoing process that, to date, has involved the following efforts:

LIBRARIES

On August 4, 2008, the Energy Commission staff sent the GWF Tracy AFC to the following libraries in San Joaquin County: Tracy Branch Library, Fair Oaks Branch Library, Margaret K. Troke Branch Library, Weston Ranch Branch Library, Cesar Chavez Central Library, and the Maya Angelou Southeast Branch Library. In addition, to these local libraries, copies of the AFC are also available at the Energy Commission's

Library in Sacramento, the California State Library in Sacramento, as well as, public libraries in Eureka, Fresno, Los Angeles, San Diego, and San Francisco.

PUBLIC OUTREACH EFFORTS

The Energy Commission staff provided notification by letter and enclosed a notice of the October 23, 2008 Informational Hearing and Site Visit to the proposed site of the GWF Tracy project. In addition to property owners and persons on the general project mail-out list, notification was provided to local, state and federal public interest and regulatory organizations with an expressed or anticipated interest in this project. Also, elected and certain appointed officials of San Joaquin County were similarly notified of the hearing and site visit.

DATA RESPONSE AND ISSUE RESOLUTION WORKSHOP

The Energy Commission staff provided notification by letter and enclosed a notice of the December 11, 2008 Data Response and Issue Resolution Workshop to property owners and persons on the general project mail-out list. Notification was also provided to local, state and federal public interest and regulatory organizations with an expressed or anticipated interest in this project.

PRELIMINARY STAFF ASSESSMENT WORKSHOP

The Preliminary Staff Assessment (PSA) was published on June 9, 2009. The Energy Commission staff provided notification by letter and enclosed notice of the PSA Workshop held on June 23, 2009 in Tracy. In addition to property owners and persons on the general project mail-out list, notification was provided to local, state and federal public interest and regulatory organizations with an expressed or anticipated interest in this project.

NOTIFICATION TO THE LOCAL NATIVE AMERICAN COMMUNITY

In addition to the October 23, 2008, and December 11, 2008, mail-outs which were sent to the Native American Heritage Commission, on April 6, 2009, the local Native American community were sent letters advising them of the proposed project and providing them with contact information. In addition, their names have been added to the GWF Tracy project mail-out list and will, therefore, be receiving a copy of all Commission notices for events and reports related to this project.

PUBLIC ADVISER'S OFFICE

The Public Adviser helps the public participate in the Energy Commission's hearings and meetings. The Public Adviser assists the public by advising them how they can participate in the Energy Commission process; however, the Public Adviser does not represent members of the public.

Related to the proposed GWF Tracy project, the Public Adviser's Office attended and presented information at the October 23, 2008 Informational Hearing and Site Visit.

Staff has also considered the comments of interveners, community groups, and individual members of the public in its analysis.

ISSUES RAISED BY THE PUBLIC

At this time, there have been three concerns brought to the attention of the California Energy Commission:

- The first concern was related to potential increase of hazardous waste from the GWF Tracy facility. This concern is discussed in the Waste Management section.
- The second concern was brought by the Tuso Family, which lives near the proposed site. The family spoke at the June 23, 2009 Preliminary Staff Assessment Workshop. Their concerns are discussed in the following sections: Noise and Vibration, Air Quality, Visual Resources, and Public Health.
- The third concern was brought by Tracy Hills, LLC a real estate developer with property located next to the proposed site. Their concern is addressed in the Visual Resources section.

In all instances, the concerns were addressed in the appropriate FSA sections.

ENVIRONMENTAL JUSTICE

California law defines environmental justice as “the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies” (Government Code Section 65040.12 and Public Resources Code Section 72000).

All Departments, Boards, Commissions, Conservancies and Special Programs of the Resources Agency must consider environmental justice in their decision-making process if their actions have an impact on the environment, environmental laws, or policies. Such actions that require environmental justice consideration may include:

- Adopting regulations;
- Enforcing environmental laws or regulations;
- Making discretionary decisions or taking actions that affect the environment;
- Providing funding for activities affecting the environment; and
- Interacting with the public on environmental issues.

In considering environmental justice in energy facility siting cases, staff uses a demographic screening analysis to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. The demographic screening is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality, December, 1997) and *Guidance for Incorporating Environmental Justice Concerns in EPA’s Compliance Analyses* (U.S. Environmental Protection Agency, April, 1998). The screening process relies on Year 2000 U.S. Census data to determine the presence of minority and below-poverty-level populations.

Environmental Justice: Guidance Under the National Environmental Policy Act, defines minority individuals as members of the following groups: American Indian or Alaskan

Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population is identified when the minority population of the potentially affected area is (1) greater than 50%; or (2) or when one or more U.S. Census blocks in the potentially affected area have a minority population of greater than 50%.

In addition to the demographic screening analysis, staff follows the steps recommended by the U.S. EPA's guidance documents which are: outreach and involvement; and if warranted, a detailed examination of the distribution of impacts on segments of the population.

Staff has followed each of the above steps for the following 11 sections in the FSA: Air Quality, Hazardous Materials, Land Use, Noise, Public Health, Socioeconomics, Soils and Water, Traffic and Transportation, Transmission Line Safety/Nuisance, Visual Resources, and Waste Management. Over the course of the analysis for each of the 11 areas, staff considered potential impacts and mitigation measures and whether there would be a significant impact on an environmental justice population.

DETERMINING MINORITY POPULATION

Socioeconomics Figure 1 (located in the Socioeconomics section of this FSA shows the minority population within the six-mile radius of the proposed GWF Tracy site. The total population within the six-mile radius is 61,949 persons, with a total minority population of 28,009 persons (or 45.2%), which is less than the 50% threshold.

However, **Socioeconomics Figure 1** shows 208 census blocks out of 748 census blocks that include minority populations greater than 50%.

DETERMINING POVERTY-LEVEL POPULATION

Below-poverty-level populations are identified based on Year 2000 census block group data. Poverty status excludes institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old. The total population of census block groups within a six-mile radius of the GWF Tracy site (for which poverty status was determined by the US Census) is 61,105 persons with a total of 5,362 persons below the poverty level (or 8.7% of the total six-mile radius population for which poverty status was determined).

SIGNIFICANT IMPACTS

Staff has determined that in the above-mentioned sections of the FSA there is a reasonable likelihood that significant impacts can be mitigated through the conditions of certification thereby ensuring that there would be no disproportionate or significant impact on an environmental justice population.

Staff has worked closely with the applicant and the residents of the area to identify local mitigation measures designed to reduce, to the greatest extent possible, any impact that will occur in the community surrounding the proposed project. Staff's environmental justice outreach has been incorporated into its overall outreach activity. This activity is summarized in the **INTRODUCTION** section to the FSA, and in the subsections to this Executive Summary titled Agency Coordination and Outreach Efforts.

STAFF'S ASSESSMENT

Each technical area section of the FSA contains a discussion of the project setting, impacts, and where appropriate, mitigation measures and proposed conditions of certification. The FSA includes staff's preliminary assessment 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;
- Compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation;
- Environmental justice for minority and low income populations;
- Conclusions and recommendations; and,
- Proposed conditions of certification.

SUMMARY OF PROJECT RELATED IMPACTS AND STAFF'S CONCLUSIONS

Staff believes that as currently proposed, including the applicant's and the staff's proposed mitigation measures and the staff's proposed conditions of certification, the GWF Tracy project would comply with all applicable laws, ordinances, regulations, and standards (LORS).

For a more detailed review of potential impacts and LORS conformance, see staff's technical analyses in the FSA. The status of each technical area is summarized in the table below and the subsequent text.

In summary this FSA finds that the project is in conformance with all LORS.

Technical Area	Complies with LORS	Impacts Mitigated
Air Quality	Yes	Yes
Biological Resources	Yes	Yes
Cultural Resources	Yes	Yes
Efficiency	Not Applicable	Not Applicable
Facility Design	Yes	Yes
Geology & Paleontology	Yes	Yes
Hazardous Materials	Yes	Yes
Land Use	Yes	Yes
Noise and Vibration	Yes	Yes
Public Health	Yes	Yes
Reliability	Not Applicable	Not Applicable
Socioeconomic Resources	Yes	None Required
Soil & Water Resources	Yes	Yes
Traffic & Transportation	Yes	Yes
Transmission Line Safety/Nuisance	Yes	Yes
Transmission System Engineering	Yes	Yes
Visual Resources	Yes	Yes
Waste Management	Yes	Yes
Worker Safety and Fire Protection	Yes	Yes

INTRODUCTION

Alan Solomon

PURPOSE OF THIS REPORT

This Final Staff Assessment (FSA) is the California Energy Commission staff's independent analysis of the proposed GWF Tracy Combined Cycle Power Plant (hereafter referred to as GWF Tracy). This FSA is a staff document. It is neither a Committee document, nor a draft decision. The FSA describes the following:

- The proposed project;
- The existing environment;
- 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;
- The potential cumulative impacts of the project in conjunction with other existing and known planned developments;
- Mitigation measures proposed by the applicant, staff, interested agencies, local organizations and interveners which may lessen or eliminate potential impacts;
- The proposed conditions under which the project should be constructed and operated, if it is certified; and
- Project alternatives.

The analyses contained in this FSA are based upon information from the: 1) Application for Certification (AFC), 2) responses to data requests, 3) supplementary information from local, state, and federal agencies, interested organizations and individuals, 4) existing documents and publications, 5) independent research, and 6) comments at workshops. 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 FSA presents staff's conclusions about potential environmental impacts and conformity with LORS, as well as proposed conditions that apply to the design, construction, operation and closure of the facility.

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

ORGANIZATION OF THE PRELIMINARY STAFF ASSESSMENT

The FSA 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: 1) air quality; 2)

public health; 3) worker safety and fire protection; 4) transmission line safety and nuisance; 5) hazardous materials management; 6) waste management; 7) land use; 8) traffic and transportation; 9) noise and vibration; 10) visual resources; 11) cultural resources; 12) socioeconomics; 13) biological resources; 14) soil and water resources; 15) geological and paleontological resources; 16) facility design; 17) power plant reliability; 18) power plant efficiency; and 19) 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;
- Proposed mitigation measures;
- Closure requirements;
- Conclusions and recommendations; and
- Conditions of certification for both construction and operation (if applicable).

ENERGY COMMISSION SITING PROCESS

The Energy Commission has the exclusive authority to certify the construction, modification 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 impacts including potential impacts to public health and safety, potential measures to mitigate those impacts [Pub. Resources Code, §25519], and compliance with applicable governmental laws or 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 contained 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)].

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

Staff conducts its environmental analysis in accordance with the requirements of CEQA. No additional Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the California Resources Agency as meeting all requirements of a certified regulatory program [Pub. Resources Code, §21080.5 and Cal. Code Regs., tit. 14, §15251 (j)]. The Energy Commission is the CEQA lead agency.

The staff prepares an FSA that presents for the applicant, interveners, organizations, agencies, other interested parties and members of the public, the staff's analysis, conclusions, and recommendations. Where it is appropriate, the FSA incorporates comments received from agencies, the public and parties to the siting case, and comments made at the workshops.

The FSA 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 Member's 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, if necessary. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision at a scheduled business meeting.

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 seeks comments from and works closely with other regulatory agencies that administer LORS that may be applicable to proposed projects. These agencies may include as applicable the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, California Coastal Commission, State Water Resources Control Board/Regional Water Quality Control Board, California Department of Fish and Game, and the California Air Resources Board. On August 4, 2008, the Energy Commission staff sent the GWF Tracy AFC to all local, state, and federal agencies that might be affected by the proposed project.

OUTREACH EFFORTS

Energy Commission regulations require staff to send notices regarding receipt of an AFC and Commission events and reports related to proposed projects, at a minimum, to property owners within 1,000 feet of a project and 500 feet of a linear facility (such as transmission lines, gas lines and water lines). This was done for the GWF Tracy project. Staff's ongoing public and agency coordination activities for this project are discussed under the Public and Agency Coordination heading in the **EXECUTIVE SUMMARY** section of the FSA.

The Energy Commission's outreach efforts are an ongoing process that, to date, has involved the following efforts:

LIBRARIES

On August 4, 2008, the Energy Commission staff sent the GWF Tracy AFC to the following libraries in San Joaquin County: Tracy Branch Library, Fair Oaks Branch Library, Margaret K. Troke Branch Library, Weston Ranch Branch Library, Cesar Chavez Central Library, and the Maya Angelou Southeast Branch Library. In addition, to these local libraries, copies of the AFC are also available at the Energy Commission's Library in Sacramento, the California State Library in Sacramento, as well as, the public libraries in Eureka, Fresno, Los Angeles, San Diego, and San Francisco.

PUBLIC OUTREACH EFFORTS

The Energy Commission staff provided notification by letter and enclosed notice of the Informational Hearing and Site Visit held on October 23, 2008 in Tracy. In addition to property owners and persons on the general project mail-out list, notification was provided to local, state and federal public interest and regulatory organizations with an expressed or anticipated interest in this project. Also, elected and certain appointed officials of San Joaquin County were similarly notified of the hearing and site visit.

DATA RESPONSE AND ISSUE RESOLUTION WORKSHOP

The Energy Commission staff provided notification by letter and enclosed notice of the Data Response and Issue Resolution Workshop held on December 11, 2008 in Tracy. In addition to property owners and persons on the general project mail-out list, notification was provided to local, state and federal public interest and regulatory organizations with an expressed or anticipated interest in this project.

PRELIMINARY STAFF ASSESSMENT WORKSHOP

The Energy Commission staff provided notification by letter and enclosed notice of the Preliminary Staff Assessment Workshop held on June 23, 2009 in Tracy. In addition to property owners and persons on the general project mail-out list, notification was provided to local, state and federal public interest and regulatory organizations with an expressed or anticipated interest in this project.

NOTIFICATION TO THE LOCAL NATIVE AMERICAN COMMUNITY

In addition to the October 23, 2008 and December 11, 2008 mail-outs which were sent to the Native American Heritage Commission, on April 6, 2009, the local Native American community were sent letters advising them of the proposed project and provided them with contact information. In addition, their names have been added to the GWF Tracy project mail-out list and will therefore be receiving a copy of all Commission notices for events and reports related to this project.

PUBLIC ADVISER'S OFFICE

The Public Adviser helps the public participate in the Energy Commissions hearings and meetings. The Public Adviser assists the public by advising them how they can participate in the Energy Commission process; however, the Public Adviser does not represent members of the public.

ENVIRONMENTAL JUSTICE

Executive Order 12898, "Federal Actions to address Environmental Justice in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on federal agencies to achieve environmental justice as part of this mission. The order requires the U.S. Environmental Protection Agency (USEPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

For all siting cases, Energy Commission staff conducts an environmental justice screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in USEPA's National Environmental Policy Act (NEPA) Compliance Analysis" dated April 1998. The purpose of the screening analysis is to determine whether a minority or low-income population exists within the potentially affected area of the proposed site.

California Statute, Section 65040.12 (c) of the Government Code, defines "environmental justice" to mean "fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." Staff's specific activities, with respect to environmental justice for the GWF Tracy project, are discussed in the **EXECUTIVE SUMMARY**.

PROJECT DESCRIPTION

Alan Solomon

INTRODUCTION

GWF Energy LLC (GWF), operates the Tracy Peaker Plant (TPP) which is a 169 megawatt power plant located near the City of Tracy.

On July 18, 2008, GWF filed an Application for Certification (AFC) with the California Energy Commission requesting approval to modify the Tracy Peaker Plant. On September 10, 2008, the Energy Commission accepted the AFC, with the supplemental information, as complete. With the proposed modifications, the GWF Tracy Combined Cycle Power Plant (GWF Tracy) is projected to increase its electricity generation 145 MW, for a combined total of 314 MW.

PROJECT PURPOSE AND OBJECTIVES

GWF's objective is to convert the TPP to a combined cycle plant in order to address the future electricity needs of California, construct and operate an electrical generating facility on an existing brown-field site, provide additional electrical capacity in the San Joaquin County and City of Tracy area, utilize existing TPP infrastructure to reduce environmental impacts and costs, and enhance the reliability of the state's electrical system by providing power generation near the centers of electrical demand.

The proposed project site consists of 16.38 acres within a 40-acre parcel in San Joaquin County, and is located within an industrial and agricultural area which includes the existing TPP. The San Joaquin County General Plan designates the proposed project site as General Agriculture and the County Zoning Designation is G 40, which allows electrical generation.

The project would include the addition of two heat recovery steam generators, a steam turbine generator, an auxiliary boiler, an air-cooled dry condenser unit, and a 115-kilovolt (kV) electrical switchyard. The proposed project would use existing TPP infrastructure, including the existing natural gas pipeline, water supply pipeline and electric transmission line.

Some major components and features of the proposed GWF Tracy project include:

- A new equipment storage area added outside the current footprint, but within an area that was previously disturbed during construction of the TPP.
- Temporary disturbance of approximately 12.3 acres for construction laydown and parking on a previously disturbed portion of the 40-acre parcel that is outside of the existing plant fence line.
- Permanent disturbance of approximately 3.28 acres associated with the relocation of the stormwater retention basin outside the current TPP fenceline.
- No new, expanded, or modified offsite linear facilities for fuel or water.

- Demolition and removal of the two existing oxidation catalyst and selective catalytic reduction (SCR) systems, including existing 100-foot stacks.
- Demolition of the existing stormwater evaporating/percolation basin to accommodate the air-cooled (dry) condenser (ACC) unit on the existing site.
- Addition of two new heat recovery steam generators (HRSG), each receiving the exhaust from one of the existing General Electric Frame 7EA combustion turbine generators (CTGs), and equipped with 324 MMBtu/hr, HHV capacity, natural gas-fired duct burners.
- Addition of new higher efficiency oxidation catalyst system within each HRSG to control carbon monoxide (CO) and volatile organic compounds (VOC) emissions to outlet concentration of less than 2 parts per million volume dry (ppmvd) at 15 percent oxygen (O2) and less than 2 ppmvd at 15 percent O2 respectively.
- Addition of a new higher-efficiency SCR system within each HRSG reusing the existing aqueous ammonia storage system to control oxides of nitrogen (NOx) emissions less than 2 ppmvd at 15 percent O2.
- Modification of the wastewater treatment system to optimize water supply requirements and minimize offsite water disposal
- Addition of two new 150-foot-tall, 17-foot-diameter, exhaust stacks replacing the existing exhaust stacks, each equipped with existing continuous emissions monitoring systems for CO, NOx and O2.
- Addition of a new 85 MMBtu/hr capacity natural gas-fired auxiliary boiler equipped with ultra low NOx burner(s) and 50-foot-tall, 48-inch-diameter stack.
- Addition of new nominal 145 MW (net output) condensing steam turbine generator (STG)
- Addition of a new 114-foot-tall by 234-foot-long by 215-foot-wide ACC system for system heat injection.
- An increase in annual water consumption of approximately 25.5 acre-feet per year for HRSG feedwater makeup and lube oil cooler.
- Addition of a new 400,000 gallon fire/service water storage tank, modification to increase the existing 250,000-gallon firewater tank to 300,000 gallons, and the addition of a 125,000-gallon de-mineralized water tank.
- Addition of an onsite 115-kV switchyard to provide an additional circuit breaker and transformer for the STG power output.
- Addition of an onsite 115-kV overhead transmission line from the STG step up transformer to the existing 115-kV switchyard.

PROJECT LOCATION

The proposed project would occupy a 16.38-acre, fenced site within the existing GWF-owned 40-acre parcel in an unincorporated portion of San Joaquin County immediately

southwest of Tracy, California, and approximately 20 miles southwest of Stockton, California.

The property is bounded by the Delta-Mendota Canal to the southwest, agricultural property to the south and east, and the Union Pacific Railroad to the north. Immediately north of the railroad are the Owens-Brockway glass container manufacturing plant and the Nutting-Rice warehouse.

The power plant area is accessed via an existing 3,300-foot, asphalt-paved service road southward from W. Schulte Road.

PROJECT FEATURES

NATURAL GAS SUPPLY

The existing Tracy Peaker Project (TPP) is serviced by a Pacific Gas and Electric Company (PG&E) natural gas pipeline which connects to the TPP. The existing natural gas pipeline that services the TPP would be tapped into to provide natural gas to the two heat recovery steam generator duct burner skids and to the auxiliary boiler. All work would be done at the current TPP site. No additional pressurization or other modifications to the natural gas pipeline would be required.

WATER SUPPLY

The Byron-Bethany Irrigation District (BBID) would supply GWF Tracy with water from the Delta-Mendota Canal using the existing pipeline developed for the original Tracy Peaker Project.

Based on their property size, GWF has the right to 136 acre-feet per year (AFY) of water. If approved, the average annual water consumption for GWF Tracy would be approximately 54.4 AFY, based on an annual operation of 8,000 hours/year at full plant output. This is an increase of 25.5 AFY over the current annual water usage.

WASTEWATER AND STORM WATER DISCHARGE

Small amounts of industrial wastewater from GWF Tracy would be stored on site and periodically transported from the plant via licensed haulers for offsite recycle or disposal. Industrial wastewater and contact storm water runoff from the plant would be stored in an onsite storage unit and transported off site by truck. Noncontact storm water from the plant site would be channeled and directed to an onsite evaporation/percolation basin. All sanitary wastewater would be routed on site to an existing septic tank/leach field.

TRANSMISSION SYSTEM

GWF proposes to modify the existing Tracy Peaker Project. Part of the modifications include installing a new steam turbine generator (STG) which would be connected to an individual, dedicated, three-phase generation step-up transformer that would be connected to the existing 115-kV onsite Tracy Switchyard bus via an overhead transmission line. From the Tracy Switchyard, the generated power would be connected to the regional electric grid via the existing onsite 115-kV overhead

transmission tie-line and the existing Pacific Gas and Electric Company (PG&E) Schulte Switching Station located on the GWF Tracy site. To connect the new equipment, two short segments of the PG&E's 115 kV transmission system (totaling approximately 2.3 miles) would require reconductoring (upgraded wires to accommodate the added generating capacity). The reconductoring segments would be approximately 1.6 miles and 0.7 mile long, respectively, near the intersection of Interstate 5 (I-5) and I-205, near the PG&E Kasson Substation.

PROJECT CONSTRUCTION AND OPERATION

If approved by the Energy Commission, the applicant proposes to begin project construction during the second quarter of 2011. It would take 24 months to complete the project. Construction is expected to cost approximately $232 million. The applicant expects that commercial operation would begin in the second quarter of 2013.

CONSTRUCTION WORKFORCE

Actual construction would take place over approximately 22 months, from third quarter 2011 to second quarter 2013. Personnel requirements would be minimal during the mobilization and site grading period (the first 3 months of the construction period) and during the startup and testing period (the last 3 months of the construction period).

There would be an average and peak workforce of approximately 171 and 398, respectively, of construction craft people, supervisory, support, and construction management personnel on site during construction. Construction personnel requirements would peak in month 17 of the construction period.

OPERATION WORKFORCE

The project would have a small-sized workforce during operations; an estimated workforce of 17 full time equivalent personnel would be needed to staff the facility 24 hours per day/seven days per week. The staff would be composed of:

- 2 Managers (Standard 8-hour day, 5 days/week).
- 8 Operators (two rotating 12-hour shifts. 7 days/week, 24 hours/day).
- 6 Maintenance Technicians (Standard 8-hour day, 5 days/week).
- 1 Administrative Personnel (Standard 8-hour day, 5 days/week).

FACILITY CLOSURE

The anticipated life of the combined cycle units that would be installed is, at a minimum, at least 30 years. Continued operation of GWF Tracy beyond this time is likely to be viable, especially with good maintenance practices; however, at an appropriate point beyond that, the project would cease operation and close down. At that time it would be necessary to ensure that the closure occurs in such a way that the 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 would 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. Facility closure would be consistent with laws, ordinances, regulations and standards in effect at the time of closure.

REFERENCES

GWF2008a - GWF Energy LLC/D. Wheeler (tn: 47105). Application for Certification for GWF Tracy Combined Cycle Power Plant Project, dated 7/10/2008. Submitted to CEC/Docket Unit on 7/18/2008.

ENVIRONMENTAL ASSESSMENT

AIR QUALITY

Testimony of Brewster Birdsall, P.E., QEP

SUMMARY OF CONCLUSIONS

Staff finds that with the adoption of the attached conditions of certification, the proposed GWF Tracy Combined Cycle Power Plant Project (GWF Tracy) would not result in significant air quality related impacts and that the GWF Tracy project would likely conform with applicable federal, state and San Joaquin Valley Air Pollution Control District (SJVAPCD or District) air quality laws, ordinances, regulations and standards (LORS).

Staff finds that GWF Energy LLC (GWF) originally provided mitigation as part of the original Energy Commission decision for the GWF Tracy Peaker Project (TPP) in the form of emission reduction credits (ERCs) to fully offset all nonattainment pollutants and their precursors at a minimum ratio of one-to-one, and to reduce the potential impacts of the proposed project to less than significant.

Staff notes that GWF, separate from the Energy Commission review of GWF Tracy, has independently agreed to fund an additional air quality improvement program that will be paid to and administered by the SJVAPCD (GWF2009a). Staff does not formally recommend or oppose the agreement, which staff considers to be separate from the California Environmental Quality Act (CEQA) process implemented by the Energy Commission and not designed to provide CEQA mitigation (SJVAPCD2009b).

Staff and the U.S. Environmental Protection Agency raised questions for the District during this analysis regarding the ability of GWF Tracy project to conform with New Source Review requirements, namely the offset requirements for proposed emission increases (CEC2009a and USEPA2009a). In response, the SJVAPCD revised its evaluation to show that a “netting” action would be used to satisfy District requirements in Rule 2201, and that the District would also conduct a separate transaction in its “offset equivalency tracking system” to ensure that the separate federal offset requirements are met (SJVAPCD2009d).

Global climate change and greenhouse gas emissions from the project are analyzed in **AIR QUALITY APPENDIX AIR-1**. The GWF Tracy project would emit under 0.48 metric tonnes of carbon dioxide per megawatt hour (MTCO2/MWh). At these levels, the project could comply with the limits of SB 1368 (Perata, Chapter 598, Statutes of 2006) and the Emission Performance Standard for base load power plants seeking contracts with California’s utilities. Mandatory reporting of the GHG emissions would occur while the Air Resources Board develops greenhouse gas regulations and/or trading markets. The project may be subject to GHG reduction or trading requirements as these regulations become more fully developed and implemented.

INTRODUCTION

This analysis evaluates the expected air quality impacts from the emissions of criteria air pollutants from both the construction and operation of the GWF Tracy project.

Criteria air pollutants are defined as air contaminants for which the state and/or federal government has established an ambient air quality standard to protect public health.

The criteria pollutants analyzed are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), and particulate matter (PM). Two subsets of particulate matter are inhalable particulate matter (less than 10 microns in diameter) (PM10) and fine particulate matter (less than 2.5 microns in diameter) (PM2.5). Nitrogen oxides (NOx, consisting primarily of nitric oxide (NO) and NO_2) and volatile organic compounds (VOC) emissions readily react in the atmosphere as precursors to ozone and, to a lesser extent, particulate matter. Sulfur oxides (SOx) readily react in the atmosphere to form particulate matter and are major contributors to acid rain. Global climate change and greenhouse gas (GHG) emissions from the project are discussed and analyzed in the context of cumulative impacts (**AIR QUALITY APPENDIX AIR-1**).

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

- Whether the GWF Tracy project is likely to conform with applicable federal, state, and SJVAPCD air quality laws, ordinances, regulations and standards (Title 20, California Code of Regulations, section 1744 (b));
- Whether the GWF Tracy project is likely to cause new violations of ambient air quality standards or contribute substantially to existing violations of those standards (Title 20, California Code of Regulations, section 1743); and
- Whether mitigation measures proposed for the project are adequate to lessen potential impacts to a level of insignificance (Title 20, California Code of Regulations, section 1742 (b)).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws and policies pertain to the control of criteria pollutant emissions and the mitigation of air quality impacts. Staff's analysis examines the project's compliance with these requirements, shown in **Air Quality Table 1**.

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	**U.S. Environmental Protection Agency**
CAAA of 1990, 40 CFR 50	National Ambient Air Quality Standards (NAAQS).
CAA Sec. 171-193, 42 USC 7501,40 CFR 51	New Source Review (NSR) – Requires NSR permit for new stationary sources. This requirement is addressed through SJVAPCD Rule 2201.
40 CFR 52.21	Prevention of Significant Deterioration (PSD) – Requires dispersion modeling to demonstrate no violation of NAAQS or PSD increments, for pollutants that attain the NAAQS. A PSD permit is not required because GWF Tracy would neither be a new major stationary source nor a major modification to an existing major source, under the federal definitions of these terms in the PSD rules. GWF Tracy is not considered to be a new major stationary source since the criteria pollutant potential to emit (PTE) would be less than the PSD major source threshold for the fossil fuel-fired steam-electric plant category, which is 100 tons per year for each PSD criteria pollutant (NO_2, CO, PM10, and SO_2). GWF Tracy would not be a major modification under PSD since the existing facility is not a PSD major source and the new project emissions would not by themselves be major. The PSD program in the San Joaquin Valley is administered by the U.S. EPA.
40 CFR 60, Subpart KKKK	Standards of Performance for Stationary Combustion Turbines, New Source Performance Standard (NSPS). Replaces NSPS Subparts Da and GG for the modified combustion turbines and new duct burners with heat recovery steam generators. Requires the proposed combined cycle units to achieve 15 ppm NOx and achieve fuel sulfur standards.
40 CFR 60, Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. Requires monitoring of the natural gas fuel source for the proposed auxiliary boiler.
40 CFR 60, Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Requires the new emergency fire water pump engine to achieve: 3.0 grams per horsepower-hour (g/bhp-hr) of non-methane hydrocarbons and NOx (NMHC+NOx) and 0.15 g/bhp-hr PM, which are levels equivalent to U.S. EPA Tier 3 standards. The existing diesel-fired standby generator engine would not be subject to Subpart IIII.
40 CFR 70, CAA Sec 401, 42 USC 7651	Federal Title V Operating Permit Program. Consolidates the federally-enforceable operating limits. Application required within one year following start of operation. This program is within the jurisdiction of the SJVAPCD with U.S. EPA oversight [SJVAPCD Rule 2520].
40 CFR 72, CAA Sec 401 42 USC 7651	Title IV Acid Rain – Applicable to electrical generating units greater than 25 MW. Requires Title IV permit and compliance with acid rain provisions, implemented through the Title V program. This program is within the jurisdiction of the SJVAPCD with U.S. EPA oversight [SJVAPCD Rule 2540].

Applicable Law	Description
State	**California Air Resources Board and Energy Commission**
Health and Safety Code (HSC) Section 40910-40930	Permitting of source needs to be consistent with approved clean air plan. The SJVAPCD New Source Review (NSR) program is consistent with regional air quality management plans.
California Health & Safety Code Section 41700	Public Nuisance Provisions – Outlaws the discharge of air contaminants that cause nuisance, injury, detriment, or annoyance.
California Code of Regulations for Off-Road Diesel-Fueled Fleets (13 CCR §2449, et seq.)	General Requirements for In-Use Off-Road Diesel-Fueled Fleets – Requires owners and operators of in-use (existing) off-road diesel equipment and vehicles to begin reporting fleet characteristics to CARB in 2009 and meet fleet emissions targets for diesel particulate matter and NOx in 2010.
Airborne Toxic Control Measure for Idling (ATCM, 13 CCR §2485)	ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling – Generally prohibits idling longer than five minutes for diesel-fueled commercial motor vehicles.
Local	**San Joaquin Valley Air Pollution Control District**
Regulation I, General Provisions	Establishes the requirements and standards for stack monitoring, source sampling, and breakdown events and identifies penalties.
Regulation II, Permits	Establishes the regulatory framework for permitting new and modified sources. Included in these requirements are the federally-delegated requirements for NSR, the Title V Operating Permit Program, and the Title IV Acid Rain Program.
Rule 2201, New and Modified Stationary Sources	Establishes the pre-construction review requirements for new, modified or relocated emission sources, in conformance with NSR to ensure that these facilities do not interfere with progress in attainment of the ambient air quality standards and that future economic growth in the San Joaquin Valley is not unnecessarily restricted. Establishes the requirement to prepare a Preliminary Determination of Compliance (PDOC) and Final Determination of Compliance (FDOC) during District review of an application for a power plant. This regulation establishes Best Available Control Technology (BACT) and emission offset requirements. Because the project net emission increase of NOx would exceed the federal major modification threshold (40 CFR 51.165). The SJVAPCD classifies the project as a Federal Major Modification for NOx, and public notification requirements and statewide compliance demonstration are triggered (SJVAPCD2009d).
Rule 2520, Federally Mandated Operating Permits	Establishes the permit application and compliance requirements for the federal Title V federal permit program. GWF Tracy qualifies as a Title V facility that is subject to NSPS, and GWF must submit the application to modify the Title V permit (as in AFC Table 5.1-19, p. 5.1-31, GWF2008a).

Applicable Law	Description
Rule 2540, Acid Rain Program	Implements the federal Title IV Acid Rain Program, which requires subject facilities to obtain emission allowances for SOx emissions and requires fuel sampling and/or continuous monitoring to determine SOx and NOx emissions.
Regulation IV, Prohibitions	Sets forth the restrictions for visible emissions, odor nuisance, various air emissions, and fuel contaminants. Regulation IV incorporates the NSPS provisions of 40 CFR 60, including standards for stationary combustion turbines (Subpart KKKK). These rules limit emissions of NOx, VOC, CO, particulate matter, and sulfur compounds.
Rule 4306, Boilers, Steam Generators, and Process Heaters	Limits NOx and CO from boilers and steam generators. The proposed auxiliary boiler is subject to NOx limit of 9 parts per million by volume (ppmv) and CO limit of 400 ppmv.
Rule 4702, Internal Combustion Engines	Limits emissions of NOx, CO, and VOC from internal combustion engines. However, as emergency units, the new emergency fire water pump engine would be exempt from emission limits, subject to monitoring and recordkeeping. The existing emergency standby engine-generator set is also subject to monitoring and recordkeeping.
Rule 4703, Stationary Gas Turbines	Limits the proposed stationary gas turbine emissions of NOx to 5 ppmv over a 3-hour averaging period and CO to 25 ppmv. Provided certain demonstrations are made, the emission limits do not apply during startup, shutdown, or reduced load periods (defined as “transitional operation periods”).
Regulation V, Procedure before the Hearing Board	Establishes the procedures for reporting emergencies and emergency variances.
Regulation VIII, Fugitive PM10 Prohibition	Sets forth the requirements and performance standards for the control of emissions from fugitive dust causing activities.

SETTING

CLIMATE AND METEOROLOGY

The climate in California is typically dominated by the eastern Pacific high pressure system centered off the coast of California. In the summer, this system results in low inversion layers and clear skies inland and typically early morning fog by the coast. In winter, this system promotes wind and rainstorms originating in the Gulf of Alaska and striking Northern California.

The climate of the southern San Joaquin Valley is characterized by hot dry summers and mild winters with precipitation almost exclusively in the winter. Very little precipitation occurs during the summer months because the Pacific high pressure blocks migrating storm systems. Beginning in the fall and continuing through the winter, the storm belt and zone of strong westerly winds begins to greatly influence California.

Temperature, winds, and rainfall are variable during fall and winter months, and stagnant conditions occur more frequently than during summer.

Wind speeds are generally higher in summer than in winter and are typically north-northwesterly winds. During the spring, summer, and fall, the stronger winds are caused by a combination of offshore and thermal low pressure resulting from high temperatures in the Central Valley. During the winter months, winds are more variable and are predominantly northerly. Calm conditions occur more during winter, but are relatively infrequent throughout the year. Valley fog often occurs during these calm, stagnant atmospheric conditions, when temperature inversions trap a layer of cool, moist air near the surface. The annual average rainfall at the project site is 14.5 inches and most precipitation (90%) occurs during October through April. Long-term average temperature and precipitation data from the nearest meteorological station, the Tracy Carbona Station, indicates that July is the warmest month of the year, with a normal daily minimum of 57°F. In the fall and spring, daily maximum temperature is in the range of the 60s and 70s, and daily minimum temperature is in the range of 40s and 50s. In the winter, daily temperature is ranged between 37°F and 54°F (WRCC, 2008).

Along with the wind flow, atmospheric stability and mixing heights are important factors in the determination of pollutant dispersion. Atmospheric stability is an indicator of the air turbulence and mixing. During the daylight hours of the summer when the earth is heated and air rises, there is more turbulence, more mixing, and thus less stability. During these conditions there is more air pollutant dispersion and therefore usually reduced air quality impacts near any single air pollution source. During the winter months between storms, however, very stable atmospheric conditions occur, resulting in very little mixing. Under these conditions, minimal air pollutant dispersion occurs, and consequently higher air quality impacts may result near sources. Because lower mixing heights generally occur during the winter, along with lower mean wind speeds and less vertical mixing, dispersion occurs less rapidly.

AMBIENT AIR QUALITY STANDARDS

The United States Environmental Protection Agency (U.S. EPA) and the California Air Resource Board (ARB) have both established allowable maximum ambient concentrations of criteria air pollutants, based upon public health impacts called ambient air quality standards. The California Ambient Air Quality Standards (CAAQS), established by ARB, are typically lower (more stringent) than the federally established National Ambient Air Quality Standards (NAAQS). The federal Clean Air Act requires the periodic review of the science upon which the standards are based and the standards themselves.

Ambient air quality standards are designed to protect people who are most susceptible to respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. The ambient standards are also set to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

Current state and federal air quality standards are listed in **Air Quality Table 2**. The averaging times for the various air quality standards (the duration over which all

measurements taken are averaged) range from one hour to one year. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per unit volume of air, in milligrams (mg or 10^{-3} g) or micrograms (µg or 10^{-6} g) of pollutant in a cubic meter (m^3) of ambient air, drawn over the applicable averaging period.

Air Quality Table 2
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Standard
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	None
	8 Hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	150 µg/m^3
	Annual	20 µg/m^3	None
Fine Particulate Matter (PM2.5)	24 Hour	None	35 µg/m^3
	Annual	12 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m^3)	None
	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 µg/m^3)	None
	3 Hour	None	0.5 ppm (1300 µg/m^3)
	24 Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)
	Annual	None	0.03 ppm (80 µg/m^3)

Source: ARB (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf), April 2008.

The California Air Resources Board and the U.S. EPA designate regions where ambient air quality standards are not met as “nonattainment areas.” Where a pollutant exceeds standards, the federal and state Clean Air Acts both require air quality management plans that demonstrate how the standards will be achieved. These laws also provide the basis for implementing agencies to develop mobile and stationary source performance standards.

EXISTING AMBIENT AIR QUALITY

Air Quality Table 3 summarizes the attainment status of the air quality in the San Joaquin Valley. Violations of federal and state ambient air quality standards for ozone, particulate matter, and CO have occurred historically throughout the region. Since the early 1970s, substantial progress has been made toward controlling these pollutants. Although air quality improvements have occurred, violations of standards for particulate matter and ozone persist.

Air Quality Table 3
Attainment Status of San Joaquin Valley Air Pollution Control District

Pollutants	Federal Classification	State Classification
Ozone (1-hr)	No Federal Standard	**Nonattainment (Severe)**
Ozone (8-hr)	**Nonattainment (Serious)** [a]	**Nonattainment**
PM10	Attainment [b]	**Nonattainment**
PM2.5	**Nonattainment**	**Nonattainment**
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment

Source: SJVAPCD 2008 (http://www.valleyair.org/aqinfo/attainment.htm).
Notes:
[a] In April 2007, the SJVAPCD Governing Board proposed to re-classify the region as "extreme" nonattainment, and the U.S. EPA is reviewing the request.
[b] In November 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 National Ambient Air Quality Standard (NAAQS) and approved the PM10 Maintenance Plan.

Nonattainment Criteria Pollutants

Air Quality Table 4 summarizes the existing ambient monitoring data for nonattainment criteria pollutants (ozone and particulate matter) collected by ARB and SJVAPCD from monitoring stations closest to the project site. Data marked in **bold** indicates that the most-stringent current standard was exceeded. Note that an exceedance is not necessarily a violation of the standard, and that only persistent exceedances lead to designation of an area as nonattainment.

Air Quality Table 4
GWF Tracy, Summary of Highest Measured Concentrations (ppm or μg/m^3)

Pollutant, Location	Averaging Time	2002	2003	2004	2005	2006	2007	2008
Ozone (ppm)	1 hour	**0.107**	**0.103**	**0.109**	**0.099**	**0.121**	**0.097**	**0.123**
Ozone (ppm)	8 hour	**0.096**	**0.089**	**0.097**	**0.086**	**0.103**	**0.083**	**0.103**
PM10 (μg/m^3)	24 hour	**87**	**88**	**60**	**79**	**94.2**	**75.1**	**126.8**
PM10 (μg/m^3)	Annual	**35.5**	**28.1**	**28.6**	**28.9**	**33.4**	**27.7**	N/A
PM2.5 (μg/m^3)	24 hour	**64.0**	**45.0**	**41.0**	**63.0**	**47.0**	**61.0**	**85.3**
PM2.5 (μg/m^3)	Annual	**16.7**	**13.6**	**13.2**	**12.5**	**13.5**	**13.5**	N/A

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html). Accessed February 2009.
Notes: Ozone 2002-2004: Tracy-24371 Patterson Pass Road; 2005: Stockton-Hazelton Street; 2006-2008: Tracy-Airport.
PM10 2002-2005:Stockton-Hazelton Street; 24-hr 2006-2008: Tracy-Airport; annual 2006-2008: Stockton-Hazelton Street.
PM2.5 2002-2008: Stockton-Hazelton Street; except 24-hr 2007-2008: Tracy-Airport.

Ozone

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between precursor air pollutants. The primary ozone precursors are NOx and VOC, which interact in the presence of sunlight and warm air temperatures to form ozone. Ozone formation is highest in the summer and fall when abundant sunshine and high temperatures trigger the necessary photochemical reactions, and lowest in the winter. The days with the highest ozone concentrations commonly occur between June and August, but the region's ozone management season officially runs from April through November (the second and third calendar quarters, Q2 and Q3).

Respirable Particulate Matter (PM10)

PM10 is a mixture of particles and droplets that vary in size and chemical composition, depending upon the origin of the pollution. An extremely wide range of sources, including natural causes, most mobile sources, and many stationary sources, causes emissions that directly and indirectly lead to increased ambient particulate matter. This makes it an extremely difficult pollutant to manage. Particulate matter caused by any combustion process can be generated directly by burning the fuel, but it can also be formed downwind when various precursor pollutants chemically interact in the atmosphere to form solid precipitates. These solids are called secondary particulate matter since the contaminants are not directly emitted, but are rather indirectly formed as a result of precursor emissions.

Gaseous contaminants such as NOx, SO_2, organic compounds, and ammonia (NH_3) from natural or man-made sources can form secondary particulate nitrates, sulfates, and organic solids. Secondary particulate matter is mostly finer PM10, whereas particles from dust sources tend to be the coarser fraction of PM10.

Air Quality Table 5 summarizes the ambient PM10 data collected from monitoring stations near the project site and the highest PM10 concentrations in the District.

Air Quality Table 5
GWF Tracy, Highest Measured PM10 Concentrations (µg/m^3)

Location	Averaging Time	2003	2004	2005	2006	2007	2008
Tracy-Airport	24 hour	---	---	---	**94.2**	**75.1**	**126.8**
	Days Over CAAQS	---	---	---	N/A	N/A	N/A
	Days Over NAAQS	---	---	---	0	0	0
	Annual	---	---	---	**20.4**	19.5	**28.1**
Stockton-Hazelton Street	24 hour	**88.0**	**60.0**	**79.0**	**82.0**	**71.0**	**104.5**
	Days Over CAAQS	17	18	47	63	24	N/A
	Days Over NAAQS	0	0	0	0	0	N/A
	Annual	**28.4**	**29.4**	**29.8**	**33.4**	**27.7**	N/A
District-wide	24 hour	**150**	**217**	**131**	**304**	**172**	**351**
	Days Over CAAQS	167	113	146	167	145	N/A
	Days Over NAAQS	0	1	0	4	1	18
	Annual	**52.4**	**47.9**	**44.3**	**55.4**	**54.8**	**52.4**

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html). Accessed February 2009.
Note: Concentrations shown are based upon California reference methods. The number of days above the CAAQS (50 µg/m^3) is calculated by ARB. Because PM10 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.

PM10 is primarily a winter problem, but high regional PM10 levels occur at other times of the year as well. Days with high PM10 concentrations commonly occur in November and December, but the region's PM10 management season officially runs from October through March (the first and fourth calendar quarters, Q1 and Q4). Northern California wildfires in Monterey County, Santa Clara County, and the Sierra Nevada foothills during June 2008 were probably responsible for the most-recent high PM10 concentrations.

Fine Particulate Matter (PM2.5)

Particles and droplets with an aerodynamic diameter less than or equal to 2.5 microns (PM2.5) penetrate more deeply into the lungs than PM10, so can therefore be much more damaging to public health than larger particles. PM2.5 is mainly a product of combustion and includes nitrates, sulfates, organic carbon (ultra-fine dust), and elemental carbon (ultra-fine soot). Almost all combustion-related particles, including those from wood smoke and cooking, are smaller than 2.5 microns. Nitrate and sulfate particles are formed through complex chemical reactions in the atmosphere. Particulate nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the winter make up a large portion of the total PM2.5. Ammonium sulfate is also a concern because of the ready availability of ammonia in the atmosphere.

Air Quality Table 6 summarizes the ambient PM2.5 data collected from the nearest monitoring stations.

Air Quality Table 6
GWF Tracy, Highest Measured PM2.5 Concentrations (μg/m^3)

Location	Averaging Time	2003	2004	2005	2006	2007	2008
Tracy-Airport	24 hour	---	---	---	---	**61.0**	**85.3**
	Annual	---	---	---	---	N/A	N/A
Stockton-Hazelton Street	24 hour	**45**	**41**	**63**	**47**	**52**	**81.2**
	Annual	**13.6**	**13.2**	**12.5**	**13.5**	**13.5**	N/A

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html). Accessed February 2009.

Attainment Criteria Pollutants

Carbon Monoxide

Carbon monoxide (CO) is a by-product of incomplete combustion common to any fuel-burning source. Ambient concentrations of CO vary substantially depending upon the proximity of the source since the pollutant disperses quickly and oxidizes in the air. Mobile sources are the principal sources of CO emissions, and they have historically been the focus of regional and statewide strategies to attain and maintain CO ambient air quality standards. Ambient CO concentrations attain the standards due to two state-wide programs for all mobile sources: the 1992 wintertime oxygenated gasoline program, and Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also helped reduce CO emissions.

Nitrogen Dioxide

Approximately 90% of the NOx emitted from combustion sources is in the form of nitric oxide, while the balance is NO_2. Nitric oxide (NO) is oxidized in the presence of ozone to form NO_2, but some level of photochemical activity is needed for this conversion. High concentrations of NO_2 occur during the fall (not in the winter) when atmospheric conditions tend to trap 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) tend to engage the NO in reactions with VOCs to create ozone and also disperse the NO_2. The formation of NO_2 in the summer, with the help of the ozone, is according to the following reaction:

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

Urban areas typically have high daytime ozone concentrations that drop substantially at night as the above reaction takes place, and ozone scavenges the available NO. If ozone is unavailable to oxidize the NO, less NO_2 will form because the reaction is "ozone-limited." This reaction explains why, in urban areas, ground-level ozone concentrations drop at night, while aloft and in downwind rural areas (without sources of fresh NO emissions), ozone concentrations can remain relatively high.

New CAAQS for NO_2 became effective in early 2008. Although the attainment designations have not yet been established for the new, more stringent standards, the San Joaquin Valley air basin appears likely to attain. Data from 2006 to 2008 shows the highest observed hourly concentration for the entire San Joaquin Valley (0.101 ppm) is well below the new 0.18 ppm NO_2 standard (ARB 2009).

Sulfur Dioxide

Sulfur dioxide is typically emitted as a result of the combustion of fuels containing sulfur. When high levels are present in ambient air, SO_2 leads to sulfite particulate formation and acid rain. Natural gas contains very little sulfur and so therefore results in very little SO_2 emissions when burned. By contrast, high sulfur fuels like coal emit large amounts of SO_2 when burned. Sources of SO_2 emissions come from every economic sector and include a wide variety of gaseous, liquid, and solid fuels. The entire state is designated attainment for all SO_2 ambient air quality standards.

Summary of Existing Ambient Air Quality

The local and recent ambient air quality data show existing violations of ambient air quality standards for ozone, PM10, and PM2.5. Staff uses the highest local (Tracy or Stockton) background ambient air concentrations as the baseline in staff's analysis of potential ambient air quality impacts for the proposed GWF Tracy project. Data from the nearest sites in Stockton, Tracy, and Bethel Island are used for CO, NO_2, and SO_2, respectively. The highest concentrations are shown in **Air Quality Table 7**.

Air Quality Table 7
GWF Tracy, Highest Local Background
Concentrations Used in Staff Assessment (μg/m^3)

Pollutant	Averaging Time	Background	Limiting Standard	Percent of Standard
PM10	24 hour	**126.8**	50	**254**
	Annual	**33.4**	20	**167**
PM2.5	24 hour	**85.3**	35	**244**
	Annual	**13.5**	12	**113**
CO	1 hour	5,039	23,000	22
	8 hour	2,634	10,000	26
NO_2	1 hour	105	339	31
	Annual	18.8	57	33
SO_2	1 hour	47.1	655	7
	24 hour	18.3	105	17
	Annual	5.2	80	7

Source: AFC Table 5.1-3 (GWF2008a), updated with ARB 2009.

EXISTING SETTING

The existing GWF Tracy Peaker Project (TPP) consists of two stationary natural gas-fired combustion turbines (nominal 169 MW combined). The Energy Commission decision allowed a maximum generating capacity of up to 8,000 hours per year, but in its first years of operation, the existing TPP has only run a fraction of those hours (a hundred hours or less annually). This means that the existing emissions from TPP in the baseline conditions are much lower than those currently allowed by Energy Commission and SJVAPCD.

Existing Emissions

The two existing combustion turbines at TPP (TPP1 and TPP2) operate on an as-needed basis, with an annual capacity factor of less than about 5% for each year since its coming online in 2003 (CEC Docket 01-AFC-16C). **Air Quality Table 8** shows the allowable (permitted) emissions from TPP and the historic actual NOx emissions reported to the Energy Commission as part of compliance monitoring between 2006 and 2008. Data for pollutants other than NOx was not readily available.

Air Quality Table 8
Existing TPP, Allowable Emissions and Actual Emissions (lb/yr)

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Existing TPP Allowable Emissions	**306,920**	**26,712**	**53,334**	**143,240**	**11,200**
Existing TPP1 (Actual) [1]	1,435	N/A	N/A	N/A	N/A
Existing TPP2 (Actual) [1]	1,342	N/A	N/A	N/A	N/A
Existing Standby Generator [2]	75	N/A	N/A	N/A	N/A
Existing TPP Average Actual Emissions [2]	3,498	N/A	N/A	N/A	N/A

Source: AFC Table 5.1-23 (GWF2008a) and CEC Order No. 03-0723-07 (July 2003)
Note 1: from operating data submitted to CEC (01-AFC-16C) from 1Q 2006 to 2Q 2008.
Note 2: from Attachment I of SJVAPCD2009d. Total emissions do not sum because different data sources and years shown.

Original Mitigation

The proposed GWF Tracy project would rely on the mitigation that was provided for the existing TPP. The existing TPP was approved in a 2002 Energy Commission Decision that required mitigation for the construction and maximum potential operational emissions originally forecasted to occur with TPP. Original Conditions of Certification AQ-C4 and AQ-62 required the TPP project owner to accumulate Emission Reduction Credits (ERCs) and surrender them to offset TPP's potential emission increases. In addition to surrendering ERCs, the original Condition of Certification AQ-78 required implementing a program of local particulate matter and ozone precursor emission reductions. **Air Quality Table 9** shows the mitigation required by the original Conditions of Certification, and **Air Quality Tables 10a to 10e** summarize the face value of the ERC certificates that were surrendered by GWF in 2003 to satisfy the original licensing requirements for TPP.

Air Quality Table 9
Existing TPP, Original Mitigation Requirements (lb)

Pollutant	Original Condition of Certification	Q1 (lb/qtr)	Q2 (lb/qtr)	Q3 (lb/qtr)	Q4 (lb/qtr)	Total (lb/yr)
NOx	AQ-62	71,730	71,730	71,730	71,730	286,920
VOC	AQ-C4	5,000	5,000	5,000	5,000	26,712
	AQ-62	1,678	1,678	1,678	1,678	
PM10	AQ-C4	7,300	7,300	7,300	7,300	53,336
	AQ-62	6,034	6,034	6,034	6,034	
CO	AQ-C4	35,768	35,768	35,852	35,852	143,240
SO_2	AQ-C4	2,800	2,800	2,800	2,800	11,200

Source: AQ-C4 (Commission Decision, July 2002), AQ-62 (CEC Order No. 03-0723-07, July 2003).

Air Quality Table 10a
Existing TPP, NOx Mitigation Provided (lb)

Name of Offset / Site of Reduction	ERC Number	Q1 (lb/qtr)	Q2 (lb/qtr)	Q3 (lb/qtr)	Q4 (lb/qtr)
757 E 11th St, Tracy	N-244-2			38,207	
757 E 11th St, Tracy	N-304-2			22,593	
757 E 11th St, Tracy	N-305-2			23,942	49
757 E 11th St, Tracy	N-306-2	1,400	1,400	23,000	1,800
757 E 11th St, Tracy	N-307-2	30	56	453	49
29400 Whitesbridge, Mendota	C-458-2		1,408	23,410	2,563
Elk Hills, S35, T30S, R23E	S-1618-2	39,452	39,890	40,329	40,329
NOx Mitigation Provided Total (lb)		**300,360**			
NOx Offsets Required for TPP		**286,920**			

Source: Energy Commission, Compliance Record for TPP (01-AFC-16C).

Air Quality Table 10b
Existing TPP, VOC Mitigation Provided (lb)

Name of Offset / Site of Reduction	ERC Number	Q1 (lb/qtr)	Q2 (lb/qtr)	Q3 (lb/qtr)	Q4 (lb/qtr)
757 E 11th St, Tracy	N-302-1	8,020	8,020	8,020	8,020
VOC Mitigation Provided Total (lb)		**32,080**			
VOC Offsets Required for TPP		**26,712**			

Source: Energy Commission, Compliance Record for TPP (01-AFC-16C).

Air Quality Table 10c
Existing TPP, PM10 Mitigation Provided (lb)

Name of Offset / Site of Reduction	ERC Number	Q1 (lb/qtr)	Q2 (lb/qtr)	Q3 (lb/qtr)	Q4 (lb/qtr)
Third & C St, Turlock	N-226-4	3,855	3,625	2,906	3,860
4004 S Eldorado St, Stockton	N-282-4	20,406	19,910	16,368	16,509
757 E 11th St, Tracy	N-306-4	302	308	4,900	391
757 E 11th St, Tracy	N-307-4			52	
PM10 Mitigation Provided Total (lb)		**93,392**			
PM10 Offsets Required for TPP		**53,336**			

Source: Energy Commission, Compliance Record for TPP (01-AFC-16C).

Air Quality Table 10d
Existing TPP, CO Mitigation Provided (lb)

Name of Offset / Site of Reduction	ERC Number	Q1 (lb/qtr)	Q2 (lb/qtr)	Q3 (lb/qtr)	Q4 (lb/qtr)
18800 Spreckels Blvd, Manteca	N-289-3	35,768	35,768	35,852	35,852
CO Mitigation Provided Total (lb)		**143,240**			
CO Offsets Required for TPP		**143,240**			

Source: Energy Commission, Compliance Record for TPP (01-AFC-16C).

Air Quality Table 10e
Existing TPP, SOx Mitigation Provided (lb)

Name of Offset / Site of Reduction	ERC Number	Q1 (lb/qtr)	Q2 (lb/qtr)	Q3 (lb/qtr)	Q4 (lb/qtr)
800 W Church St, Stockton	N-294-5	2,800	2,800	2,800	2,800
SOx Mitigation Provided Total (lb)		**11,200**			
SOx Offsets Required for TPP		**11,200**			

Source: Energy Commission, Compliance Record for TPP (01-AFC-16C).

PROJECT DESCRIPTION AND PROPOSED EMISSIONS

The GWF Tracy Combined Cycle Power Plant facility would include the following stationary sources of emissions (AFC Section 5.1.4.1.4, GWF2008a):

- Two existing General Electric Frame 7EA natural gas-fired combustion turbine generators (CTGs) modified to a combined-cycle configuration with two new heat recovery steam generators (HRSG), each equipped with 324 MMBtu/hr HHV (higher heating value) capacity, natural gas fired duct burners;
- One new condensing steam turbine generator (STG) rated at 145 MW (net output);
- One new 85 MMBtu/hr capacity natural gas-fired auxiliary boiler with ultra low NOx burner(s);
- New evaporative cooling system for the STG lubricating oil system with a wet surface air cooler (WSAC) at 3,840-gallon-per-minute total circulation rate;
- One new 288 bhp diesel fuel oil-fired emergency fire water pump engine; and
- One existing diesel emergency backup generator (471 bhp) operating up to 50 hours per year for testing and maintenance.

Separate emissions caused during the construction phase, initial commissioning, and operation are described here.

Proposed Construction Emissions

Construction of GWF Tracy is expected to take about 22 months including 20 months of demolition and construction activity and the remainder of the time for contractor mobilization and commissioning. Onsite construction activities include grading, demolition of the two existing oxidation catalyst and SCR systems, hauling and layout of equipment, materials and supplies, and facility construction. Offsite emissions would be from worker travel and truck deliveries, and there would be some minor offsite construction activity for transmission line reconductoring. During the construction period, air emissions would be generated from the exhaust of off-road/non-road construction equipment and on-road vehicles and fugitive dust from activity on unpaved surfaces and material handling. Construction activities would typically occur between 6 a.m. and 6 p.m., Monday through Saturday (AFC Section 2.2.14). The project would not include any new, expanded, or modified offsite linear facilities for fuel or water except minor

modifications, and large aggregate or soil storage piles are not proposed. Emissions from these offsite activities and material handling are expected to be minimal.

Fugitive dust emissions would result from:

- Dust entrained during preparation and grading/excavation at the construction site;
- Dust entrained during on-site travel on paved and unpaved surfaces; and
- Wind erosion of soil at areas disturbed during construction activities.

Combustion emissions during construction would result from:

- Exhaust from the diesel construction equipment used for site preparation, grading, excavation, and construction of on-site structures;
- Exhaust from water trucks used on-site to control construction dust emissions;
- Exhaust from use of diesel-powered welding machines, electric generators, air compressors, water pumps, etc.;
- Off-site exhaust from on-road diesel trucks used to deliver concrete, fuel, and construction supplies to the construction site; and
- Off-site exhaust from on-road automobiles and trucks used by workers to commute to the construction site.

Estimates for the highest daily emissions and total annual emissions over the 22-month construction period are shown in **Air Quality Table 11**.

Air Quality Table 11
GWF Tracy, Estimated Maximum Construction Emissions

Activity	NOx	VOC	PM10	PM2.5	CO	SOx
On-site Construction Equipment (lb/day)	155	23	10.66	9.49	73	0.16
On-site Construction Vehicle (lb/day)	0.03	0.017	0.004	0.003	0.19	0.0004
On-site Fugitive Dust (lb/day)	---	---	9.09	0.91	---	---
Off-site (On-road) Worker Travel (lb/day)	0.50	0.13	0.07	0.04	4.88	0.007
Off-site (On-road) Truck Deliveries (lb/day)	3.14	0.40	0.16	0.09	11.51	0.021
Maximum Daily Construction Emissions (lb/day)	**157.1**	**23.3**	**18.39**	**10.36**	**83.4**	**0.18**
On-site Construction Equipment (lb/month)	3,404	504	235	209	1,601	3.60
On-site Construction Vehicle (lb/month)	0.69	0.38	0.077	0.064	4.26	0.009
On-site Fugitive Dust (lb/month)	---	---	200.1	20.01	---	---
Off-site (On-road) Worker Travel (lb/month)	10.79	2.84	1.58	0.79	107.34	0.1579
Off-site (On-road) Truck Deliveries (lb/month)	68.98	8.80	3.61	2.02	253.15	0.46
Maximum Monthly Emissions (lb/mo)	**3,451**	**511.4**	**405.3**	**228.1**	**1,831**	**3.93**
On-site Construction Equipment (tpy)	16.0	2.2	0.96	0.86	7.5	0.02
On-site Fugitive Dust (tpy)	---	---	0.94	0.09	---	---
Off-site (On-road) Worker Travel & Truck Deliveries (tpy)	0.3	0.04	0.02	0.01	1.2	0.002
Annual Construction Emissions (tpy)	**16.3**	**2.2**	**2.1**	**0.96**	**8.7**	**0.02**

Sources: AFC Table 5.1-4 for annual; Appendix 5.1A Tables 5.1A.1a through 5.1A.11, Tables 5.1A.2a to 5.1A.2e, Tables 5.1A.5b to 5.1A.5g.
Note: Daily off-site emissions derived from monthly assuming 22 days per month. Different activities cause peak emissions at different time during the construction period; therefore, total maximum daily, monthly, and annual emissions might be different from the summation of emissions from individual activities.

Proposed Initial Commissioning Emissions

New electrical generation facilities must go through initial commissioning phases before becoming commercially available to generate electricity. During this period, initial firing causes greater emissions than those that occur during normal operations because of the need to tune the combustor, conduct numerous startups and shutdowns, operate under low loads, and conduct testing before emission control systems are functioning or fine-tuned for optimum performance.

GWF expects commissioning activities to occur during a commissioning phase for approximately 90 days, involving up to 500 hours of operation per CTG (AFC Section 5.1.4.1.2, GWF2008a; Attachment DR4-1, CH2M2008f). During commissioning, the CTGs will be operated at various loads to:

- Break-in the plant equipment;
- Commission the HRSGs and duct burners;
- Tune the SCR system's ammonia injection grid; and
- Perform final operational checks.

Air Quality Table 12 presents the predicted maximum hourly short-term emissions of criteria pollutants, as they would be allowed by the FDOC (SJVAPCD2009d). These hourly emissions differ somewhat from those for routine operational startups because they are based on the average ambient conditions at the site (ambient temperature of 59 °F and 60% relative humidity), where routine startups are considered at worst-case cold day conditions. Total commissioning emissions are also presented here; annual emission rates are not quantified since commissioning would occur only for about 90 days. Emission rates for VOC, PM10, PM2.5, and SO_2 during initial commissioning are not expected to be higher than normal operating emissions.

Air Quality Table 12
GWF Tracy, Maximum Initial Commissioning Emissions

Source	NOx	VOC	PM10	PM2.5	CO	SOx
Maximum Hourly (lb/hr, per turbine)	146.7	3.2	5.8	5.8	229.6	2.6
Total Commissioning Period (tons, both turbines)	15.9	2.0	4.3	4.3	19.7	1.3

Source: AFC Table 5.1-5 (GWF2008a); FDOC AQ-12 (SJVAPCD2009d) and Response to DR4 (CH2M2008f).

Operation Emission Controls

NOx Controls

Each combustion turbine would use dry low-NOx (DLN) combustors to maintain low levels of NOx formation while ensuring complete combustion of the fuel. Exhaust from each turbine would enter the HRSG equipped with duct burners and a Selective Catalytic Reduction (SCR) system before being released into the atmosphere. SCR refers to a process that chemically reduces NOx to nitrogen (N_2) and water vapor (H_2O)

by injecting ammonia (NH_3) into the flue gas stream in the presence of a catalyst and excess oxygen. The process is termed selective because the ammonia preferentially reacts with NOx rather than oxygen. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or noble metals are also used. Regardless of the type of catalyst used, efficient conversion of NOx to nitrogen and water vapor requires the uniform mixing of ammonia into the exhaust gas stream and a catalyst surface large enough to ensure sufficient time for the reaction to take place.

VOC and CO Controls

Emissions of CO and unburned hydrocarbons, including VOC, will be controlled with an oxidation catalyst installed in conjunction with the SCR catalyst. An oxidation catalyst system chemically reacts with organic compounds and CO with excess oxygen to form carbon dioxide (CO_2) and water. Unlike the SCR system for reducing NOx, an oxidation catalyst does not require any additional chemicals.

PM10/PM2.5 and SOx Controls

The exclusive use of pipeline-quality natural gas, a clean-burning fuel that contains very little sulfur or noncombustible solid residue, will limit the formation of SOx and particulate matter. Natural gas does contain small amounts of a sulfur-based scenting compound known as mercaptan, which results in some SOx emissions when burned. However, in comparison with other fossil fuels used in thermal power plants, SOx emissions from natural gas are very low. Particulate matter emissions from natural gas combustion are also very low compared with other fossil fuels. The sulfur content of pipeline-quality natural gas is normally less than 1 grain of sulfur per 100 cubic feet at standard temperature and pressure (gr/100 scf).

Proposed Operation Emissions

Air Quality Table 13 through **Air Quality Table 15** summarize the maximum (worst-case) criteria pollutant emissions associated with normal and routine operation of the GWF Tracy Combined Cycle Power Plant Project. Emissions for each of the two combustion turbines are based upon:

- NOx emissions controlled to 2.0 parts per million by volume, dry basis (ppmvd) corrected to 15% oxygen, averaged over any 1-hour period;
- VOC emissions controlled to 2.0 ppmvd at 15% O_2 for any 3-hour period;
- CO emissions controlled to 2.0 ppmvd at 15% O_2 for any 3-hour period;
- PM10 emissions at 5.8 lb/hr based on exclusive use of pipeline-quality natural gas fuel with no provisions for an alternative or backup fuel;
- SOx emissions based on hourly or daily levels of fuel sulfur content of up to 0.66 gr/100 scf with annual average sulfur content of 0.25 gr/100 scf (**AQ-29**); and

- Power plant availability of 92-98% annually, with approximately 8,639 hours per year per CTG, under a worst-case scenario of 325 startups (25 cold startup events, 50 warm startup events, and 250 hot startup events), 325 shutdown events, duct burners firing up to 3,100 hours per year, and 4,900 hours per year of baseload operation without duct burners firing. This also would include 4,000 hours per year of operation of the auxiliary boiler.

Air Quality Table 13 lists the maximum hourly emissions from each of the proposed individual sources estimated by GWF that would be allowable under the FDOC (SJVAPCD2009d). The maximum combined emissions from the turbines would occur in one hour during a cold startup, between the 25th minute to 85th minute under cold ambient conditions (CH2M2008f). These emissions rates represent a worst-case because they are derived from a scenario where startup of the two turbines would not be staggered.

Air Quality Table 13
GWF Tracy, Maximum Hourly Emissions Rates (lb/hr)

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Each Combustion Turbine (maximum lb/hr with duct burner firing)	10.3	3.22	5.8	6.0	2.63
Each Combustion Turbine (maximum lb/hr without duct burner firing)	8.1	1.13	4.4	3.9	2.02
Both Combustion Turbines (maximum lb/hr combined startup)[a]	399	11	9.4	375	4.9
Auxiliary Boiler	0.62	0.43	0.60	3.15	0.16
Wet Surface Air Cooler	--	--	0.20	--	--
Fire Pump Engine	1.7	0.1	0.076	1.52	0.003
Emergency Standby Generator	4.9	0.042	0.03	0.12	0.005
Total Maximum Hourly Emissions	**406**	**12**	**10**	**380**	**5.0**

Sources: AFC Table 5.1-10 (GWF2008a); Response to DR8 (CH2M2008f); SJVAPCD2009d.
Note: WSAC emissions are shown, but the source is exempt from SJVAPCD permitting.
[a] Worst-case hourly emissions based on simultaneous cold start of both turbines at ambient conditions of 15 °F and 100% relative humidity.

Air Quality Table 14 lists the worst-case emissions during any given day of operation of the proposed GWF Tracy project. Daily emissions of NOx and CO are based on one cold and one hot startup, two shutdowns, and 18.7 hours of steady state operation with duct burners firing. Daily VOC, PM10/PM2.5, and SOx emissions are based on one cold start, one shutdown, and 20.4 hours of steady state operation with duct burners firing. The auxiliary boiler emissions are based on 24 hours per day of this unit. The fire pump engine and emergency standby generator are shown assuming 24 hours of emissions on non-emergency use, though these units are not expected to operate for more than one hour at a time for testing and maintenance.

Air Quality Table 14
GWF Tracy, Maximum Daily Emissions (lb/day)

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Combustion Turbine #1	815	79	132	1,072	59
Combustion Turbine #2	815	79	132	1,072	59
Auxiliary Boiler	15	10.2	14.3	75.5	3.8
Wet Surface Air Cooler	--	--	4.8	--	--
Fire Pump Engine	41	2.4	1.8	36	0.074
Emergency Standby Generator	117	1.0	0.7	3.0	0.12
Total Daily Emissions	**1,803**	**172**	**286**	**2,259**	**122**

Source: AFC Table 5.1-10 (GWF2008a) and SJVAPCD2009d.
Note: Daily emissions for the fire pump and emergency standby generator engine are shown for 24-hours of operation, which would not occur during any non-emergency condition. WSAC emissions are shown, but the source is exempt from SJVAPCD permitting.

Air Quality Table 15 lists maximum potential annual emissions from each source of the proposed project. Annual emissions reflect each turbine operating with 325 startups (25 cold, 50 warm, and 250 hot) and shutdowns per year, 3,100 hours of operation with duct firing and the lube oil cooler (WSAC) operating, and 4,900 hours of operation at base load with WSAC operating and no duct firing. The auxiliary boiler emissions are based on 4,000 operating hours per year.

Air Quality Table 15
GWF Tracy, Maximum Proposed Annual Emissions (lb/yr and tpy)

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Combustion Turbine #1	88,881	15,145	32,250	74,598	7,084
Combustion Turbine #2	88,881	15,145	32,250	74,598	7,084
Auxiliary Boiler	2,482	1,700	2,380	12,580	238
Wet Surface Air Cooler	--	--	110	--	--
Fire Pump Engine	85	5.1	3.8	76	0.15
Emergency Standby Generator	243	2.1	1.5	6.2	0.24
Total Annual Emissions (lb/yr)	**180,572**	**31,997**	**66,995**	**161,858**	**14,406**
Total Maximum Annual Emissions (tpy)	**90.3**	**16.0**	**33.5**	**80.9**	**7.2**

Source: AFC Table 5.1-10 (GWF2008a) and SJVAPCD2009d.
Note: Annual emissions for the fire pump and emergency standby generator engine are shown for 50 hours of operation for routine testing and maintenance. WSAC emissions are shown, but the source is exempt from SJVAPCD permitting.

Air Quality Table 16 shows offsite emissions which would be required to operate the facility. GWF assumes that 13 full time workers would be onsite for 365 days per year.

Commuting distances for workers are assumed to be 60 miles per day per roundtrip. The facility would also require material deliveries, which would occur 11 times monthly. Roundtrip vehicle miles traveled for material deliveries are estimated to be 100 miles in the calculation. These offsite emissions would be minor compared to the onsite stationary sources and are not considered further.

Air Quality Table 16
GWF Tracy, Annual Offsite Emissions (lb/yr)

Source	NOx	VOC	PM10	PM2.5	CO	SOx
Worker Commutes	113	28	19	9	1,138	1.9
Material Deliveries	20	3	1	1	75	0.1
Total Annual Emissions (lb/yr)	**133**	**31**	**20**	**10**	**1,212**	**2.0**

Source: Response to Data Request 3 Table DR3-1 (CH2M2008f).
Notes: Annual emissions from worker commutes are based on 13 full time workers, commuting 60 miles daily per roundtrip, and assumes that workers would be onsite 365 days per year. Annual emissions from material deliveries assume 11 deliveries per month, traveling 100 miles per roundtrip.

Ammonia Emissions

Ammonia is injected into the flue gas stream as part of the SCR system that controls NOx emissions. In the presence of the catalyst, the ammonia and NOx react to form harmless elemental nitrogen and water vapor. However, not all of the ammonia reacts with the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered from the stacks. These ammonia emissions are known as ammonia slip.

Energy Commission staff recommends limiting ammonia slip emissions to the extent feasible. GWF proposes to limit ammonia slip emissions from the combined-cycle turbine system to 5 ppmvd, which would be consistent with the Air Resources Board recommendations in the Guidance for Power Plant Siting (ARB 1999).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff characterizes air quality impacts as follows: All project emissions of nonattainment criteria pollutants and their precursors (NOx, VOC, PM10, PM2.5, and SOx) are considered significant and must be mitigated. For short-term construction activities that essentially cease before operation of the power plant, our assessment is qualitative and mitigation consists of controlling construction equipment tailpipe emissions and fugitive dust emissions to the maximum extent feasible. For operating emissions, mitigation includes both the Best Available Control Technology (BACT) and emission reduction credits (ERC) or other valid emission reductions to offset emissions of both nonattainment criteria pollutants and their precursors.

The ambient air quality standards used by staff as the basis for characterizing project impacts are health-based standards established by the ARB and U.S. EPA. They are set at levels that contain a margin of safety to adequately protect the health of all

people, including those most sensitive to adverse air quality impacts such as the elderly, persons with existing illnesses, children, and infants.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Ambient air quality impacts occur when project emissions cause the ambient concentration of a pollutant to increase. Project-related emissions are the actual mass of emitted pollutants, which are diluted in the atmosphere before reaching the ground. Analysis begins with quantifying the emissions, then uses an atmospheric dispersion model to determine the probable change in ground-level concentrations.

Dispersion models complete the complex, repeated calculations that consider emissions in the context of various ambient meteorological conditions, local terrain, and nearby structures that affect air flow. For the GWF Tracy project, the meteorological data used as an input to the dispersion model included one year (2003) of hourly wind speeds and directions measured at the Modesto meteorological station, combined with upper-air meteorological data from Oakland.

GWF conducted the air dispersion modeling based on guidance presented in the *Guideline on Air Quality Models* (EPA, 2005) and the American Meteorological Society/Environmental Protection Agency Regulatory Model known as AERMOD (version 07026). The U.S. EPA designates AERMOD as a “preferred” model for refined modeling in all types of terrain. For determining NO_2 impacts of short-term emissions (1-hour averaging period), NOx emissions are further modeled using the more-rigorous Plume Volume Molar Ratio Method (PVMRM) adaptation of the Ozone Limiting Method (OLM). Because project NOx emissions would be approximately 90% NO that could oxidize into NO_2 with sufficient time, sunlight, and availability of organic compounds or ozone, use of the PVMRM and OLM is appropriate. Concurrent hourly ozone data from Tracy in 2003 is used in modeling the fraction of NOx emissions that convert to NO_2 impacts.

Project-related modeled concentrations are then added to highest background concentrations to arrive at the total impact of the project. The total impact is then compared with the ambient air quality standards for each pollutant to determine whether the project’s emissions would either cause a new violation of the ambient air quality standards or contribute to an existing violation.

Construction Impacts and Mitigation

Construction Impact Analysis

This section discusses the project’s short-term direct construction ambient air quality impacts assessed by GWF and, as necessary, independently assessed by Energy Commission staff. The ambient air quality impacts are modeled using the U.S EPA AERMOD (version 07026), and NOx are modeled using the AERMOD OLM option, which determines the fraction of NOx emissions that convert to short-term (1-hour) NO_2 impacts. The AFC version of the dispersion modeling used source factors (that allow variation of emissions by hour-of-day) to erroneously set emissions to zero for some hours of the year in the evaluation for annual averaging periods (GWF2008c). This

caused the AFC to underestimate the construction impacts during annual averaging periods. To correct this, staff removed the hour-of-day source factors and re-evaluated the annual construction impacts.

Air Quality Table 17 summarizes the results of the modeling analysis for construction activities. The total impact is the sum of the existing background condition plus the maximum impact predicted by the modeling analysis for project activity. The values in **bold** in the Impact and Background columns represent the values that either equal or exceed the relevant ambient air quality standard.

Air Quality Table 17
GWF Tracy, Construction-Phase Maximum Impacts (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	24.23	**126.8**	**151.0**	50	**302**
	Annual	1.82	**33.4**	**35.2**	20	**176**
PM2.5	24 hour	10.44	**85.3**	**95.7**	35	**274**
	Annual	0.86	**13.5**	**14.4**	12	**120**
CO	1 hour	727	5,039	5,766	23,000	25
	8 hour	180	2,634	2,814	10,000	28
NO_2	1 hour [a]	211	105	316	339	93
	Annual	10.7	18.8	29.5	57	52
SO_2	1 hour	1.7	47.1	48.8	655	7
	24 hour	0.16	18.3	18.5	105	18
	Annual	0.02	5.2	5.2	80	7

Sources: AFC Table 5.1-15 (GWF2008a and GWF2008c) with independent Energy Commission staff analysis.
Notes: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output.

The maximum modeled project construction impacts for particulate matter (24-hour basis) are predicted to occur at the northern and western fence line, and concentrations would decrease rapidly with distance. The maximum concentration at any location one kilometer (0.62 mile) from the site would be about one-tenth of that experienced at the fence line or 2.4 µg/m^3 PM10; at the nearest residence, 0.6 kilometer (0.4 mile) due west, construction would cause no more than about 5 µg/m^3 PM10 or 2.6 µg/m^3 PM2.5 (24-hour basis). No residential receptors exist at the fence line.

Staff believes that particulate matter emissions from construction would cause a significant impact because they will contribute to existing violations of PM10 and PM2.5 ambient air quality standards, and additionally that those emissions can and should be mitigated to a level of insignificance. Significant secondary impacts would also occur for PM10, PM2.5, and ozone because construction-phase emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would also contribute to existing violations of these standards. The direct impacts of NO_2, in conjunction with

worst-case background conditions, would not create a new violation of the 1-hour or annual NO_2 ambient air quality standard. The direct impacts of CO and SO_2 would not be significant because construction of the project would neither cause nor contribute to a violation of these standards. Mitigation for construction emissions of PM10, PM2.5, SOx, NOx, and VOC would be appropriate for reducing impacts to PM10, PM2.5, and ozone.

Construction Mitigation

GWF proposes to reduce emissions of particulate matter, particulate matter precursors, and ozone precursors by complying with local air district recommendations, soil erosion control requirements, and nuisance prohibitions. GWF proposes to implement the following measures to control construction-related fugitive dust emissions (AFC Section 5.1.6.1):

- Water unpaved roads and disturbed areas;
- Limit onsite vehicle speeds to 10 miles per hour and post the speed limit;
- Water during period of high winds when excavation/grading is occurring;
- Sweep onsite paved roads and entrance roads on an as-needed basis;
- Replace ground cover in disturbed areas as soon as practical;
- Cover truck loads when hauling material that could be entrained during transit; and
- Apply dust suppressants or covers to soil stockpiles and disturbed areas when inactive for more than two weeks.

GWF also proposes to reduce emissions with the following measures to control exhaust emissions from the heavy equipment used for construction (AFC Section 5.1.6.1):

- Use ultra-low sulfur diesel fuel (15 ppm sulfur) in all diesel fueled equipment;
- Maintain all diesel fueled equipment per manufacturer's recommendations;
- Limit diesel heavy equipment idling time to less than five minutes, to the extent practical; and
- Use electric motors for construction equipment to the extent feasible.

Staff agrees that the applicant's proposed mitigation measures would be effective, although staff believes that additional construction mitigation measures could reduce potential impacts even more. Additional measures recommended by staff would reduce construction-phase impacts to a less than significant level by further reducing construction emissions of particulate matter and combustion contaminants.

Staff believes that the short-term and variable nature of construction activities warrants a qualitative approach to mitigation. Construction emissions and the effectiveness of mitigation varies widely depending on variable levels of activity, the specific work taking place, the specific equipment, soil conditions, weather conditions, and other factors, making precise quantification difficult. Despite this variability, there are a number of feasible control measures that can be implemented to significantly reduce construction emissions. Staff has determined that the use of oxidizing soot filters is a viable

emissions control technology for all heavy diesel-powered construction equipment that does not use an ARB-certified low emission diesel engine. In addition, staff proposes that, prior to beginning construction, GWF should provide an Air Quality Construction Mitigation Plan (AQCMP) that specifically identifies mitigation measures to be employed by GWF to limit air quality impacts during construction. Staff includes proposed staff Conditions of Certification **AQ-SC1** through **AQ-SC5** to implement these requirements. These conditions are consistent with both GWF's proposed mitigation and the conditions of certification adopted in similar prior licensing cases. Compliance with these conditions would substantially eliminate the potential for significant air quality impacts during construction of the GWF Tracy project.

Operation Impacts and Mitigation

The following section discusses ambient air quality impacts that were estimated by GWF and subsequently evaluated by Energy Commission staff. GWF performed a number of direct impact modeling analyses, including both fumigation modeling and modeling for impacts during commissioning.

Routine Operation Impacts

A refined dispersion modeling analysis was performed to identify off-site criteria pollutant impacts that would occur from routine operational emissions throughout the life of the project. This impact analysis includes both maximum operating and start-up/shutdown scenarios to determine worst-case air quality impacts on both a short-term and an annual basis. The operating profiles are shown in **Air Quality Table 13** to **Air Quality Table 15**. The predicted maximum concentrations of non-reactive pollutants are summarized in **Air Quality Table 18**.

Air Quality Table 18
GWF Tracy, Routine Operation Maximum Impacts (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	2.1	**126.8**	**128.9**	50	**258**
	Annual	0.5	**33.4**	**33.9**	20	**169**
PM2.5	24 hour	2.1	**85.3**	**87.4**	35	**250**
	Annual	0.5	**13.5**	**14.0**	12	**116**
CO	1 hour	401.4	5,039	5,440.4	23,000	24
	8 hour	131.9	2,634	2,765.9	10,000	28
NO_2	1 hour [a]	219.2	105	324	339	96
	Annual	1.5	18.8	20.3	57	36
SO_2	1 hour	5.6	47.1	52.7	655	8
	24 hour	0.8	18.3	19.1	105	18
	Annual	0.1	5.2	5.3	80	7

Sources: AFC Table 5.1-17 (GWF2008a and GWF2008c) with independent Energy Commission staff analysis.
Notes: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output.
Short-term NO_2 and PM10/PM2.5 impacts do not include fire pump or emergency standby generator engine testing. With engine testing, project impacts would be: NO_2 (1-hour): 223 µg/m^3, and PM10/PM2.5: 5.2 µg/m^3. All results include gas turbine startups (combined 399 lb/hr NOx) as part of routine operation. For routine, steady-state operation during hours not involving gas turbine startups, project impacts would be NO_2 (1-hour): 19.7 µg/m^3.

The maximum impacts from the proposed combined-cycle power plant project tend to occur at the elevated terrain west of the project site. Maximum 24-hour PM10/PM2.5 impacts for the combustion turbines and duct burners (2.1 µg/m^3) occur during extremely stable, wintertime conditions on the hills approximately 2.2 miles (3.5 kilometers) west of the site. Emergency engine testing would cause the maximum PM10/PM2.5 impacts (5.2 µg/m^3) near the facility fence line. Daily and annual PM10 impacts at other low-elevation locations, not immediately adjacent to the fence line tend to be substantially lower; at the nearest residence, 0.6 kilometer (0.4 mile) due west, routine operation, with engine testing, would cause no more than about 1 µg/m^3 PM10/PM2.5 (24-hour basis).

Staff believes that particulate matter emissions from routine operation would cause a significant impact because they will contribute to existing violations of PM10 and PM2.5 ambient air quality standards. Significant secondary impacts would also occur for PM10, PM2.5, and ozone because operational emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would also contribute to existing violations of these standards. The direct impacts of NO_2, in conjunction with worst-case background conditions, would not create a new violation of the 1-hour or annual NO_2 ambient air quality standard. The NO_2 impacts would be primarily driven by startup modes or the emergency generator and fire pump engines. The maximum 1-hour NO_2 impacts determined from the turbines in steady state mode would be less than 20 µg/m^3, compared to approximately 219 µg/m^3 for the turbines in a simultaneous startup.

Additionally, using actual concurrent hourly NO_2 background concentration data rather than using the worst-case background concentration would result in lower total project impacts than shown in the table. The direct impacts of CO and SO_2 would not be significant because routine operation of the project would neither cause nor contribute to a violation of these standards. Mitigation for emissions of PM10, PM2.5, SOx, NOx, and VOC would be appropriate for reducing impacts to PM10, PM2.5, and ozone.

Secondary Pollutant Impacts

The project's gaseous emissions of NOx, SOx, VOC, and ammonia are precursor pollutants that can contribute to the formation of secondary pollutants, ozone, PM10, and PM2.5. Gas-to-particulate conversion in ambient air involves complex chemical and physical processes that depend on many factors, including local humidity, pollutant travel time, and the presence of other compounds. Currently, there are no agency-recommended models or procedures for estimating ozone or particulate nitrate or sulfate formation from a single project or source. However, because of the known relationships of NOx and VOC to ozone and of NOx, SOx, and ammonia emissions to secondary PM10 and PM2.5 formation, it can be said that unmitigated emissions of these pollutants would contribute to higher ozone and PM10/PM2.5 levels in the region. Significant impacts of ozone and PM10/PM2.5 precursors would be mitigated with SJVAPCD offsets originally provided for the TPP (**Air Quality Tables 10a to 10e**).

Ammonia is a particulate precursor but not a criteria pollutant. Reactive with sulfur and nitrogen compounds, ammonia is especially abundant in the San Joaquin Valley from natural sources, agricultural sources, and as a byproduct of tailpipe controls on motor vehicles. Ammonia particulate forms more readily with sulfates than with nitrates, and particulate formation in the San Joaquin Valley has been found to be limited by the availability of SOx and NOx in ambient air, rather than the availability of ammonia (SJVAPCD 2008 PM2.5 Plan). Offsetting SOx and NOx emissions would both avoid significant secondary PM10/PM2.5 impacts and reduce secondary pollutant impacts to a less than significant level.

Fumigation Impacts

There is the potential that higher short-term concentrations of pollutants may occur during fumigation conditions. Fumigation conditions are generally short-term in nature and only compared to 1-hour standards. GWF analyzed the air quality impacts for normal emissions under fumigation conditions using the SCREEN3 Model (version 96043) (AFC Table 5.1-18). In the fumigation impact analysis, only impacts from the turbine stack are evaluated. For comparison, the same operating scenario identified in the operational impact analysis is considered for fumigation. The short-term project impacts during fumigation would not exceed the impacts for routine operation shown in **Air Quality Table 18**, above. Therefore, no additional mitigation is required for fumigation impacts.

Commissioning-Phase Impacts

Commissioning impacts would occur any time during the forecasted 90 days of commissioning activities. Various testing, tuning, no-load, startup, and shutdown scenarios are modeled, without including the auxiliary boiler, diesel-fueled engine, and WSAC emissions. The commissioning emissions estimates are based full simultaneous

commissioning of both CTGs as would be allowed by the FDOC. Impacts due to PM10, PM2.5, and SO_2 during commissioning would occur under similar exhaust conditions as those for startup while in routine operation. **Air Quality Table 19** shows that the commissioning-phase impacts of CO and NO_2 would be similar to those during routine operations.

Air Quality Table 19
GWF Tracy, Commissioning-Phase Maximum Impacts (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
CO	1 hour	524	5,039	5,563	23,000	24
	8 hour	115	2,634	2,749	10,000	27
NO_2	1 hour [a]	187	105	292	339	86

Source: AFC Table 5.1-16 (GWF2008a and GWF2008c) with independent Energy Commission staff analysis.
Notes: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output.

Visibility Impacts

A visibility analysis of the project's gaseous emissions would only be required under the federal Prevention of Significant Deterioration (PSD) permitting program, which does not apply to GWF Tracy. For new PSD sources, a visibility analysis is required for the nearest Class I area. The nearest Class I areas to GWF Tracy are Point Reyes National Seashore, which is approximately 105 kilometers (66 miles) to the northwest, Yosemite National Park, which is approximately 160 kilometers (100 miles) to the east, and Pinnacles National Monument, which is approximately 135 (84 miles) kilometers to the south. Due to the distance to Class I areas, the project's visibility impacts on Class I areas would be considered insignificant.

Mitigation for Routine Operation

Applicant's Proposed Mitigation

The GWF Tracy project would rely upon a combination of clean-fuel-firing equipment, emission control devices, and emission reduction credits to mitigate air quality impacts. The equipment description, equipment operation, and emission control devices are provided in **AIR QUALITY PROJECT DESCRIPTION**.

In addition to the emission controls and offsets described in the GWF Tracy AFC and required by SJVAPCD rules, the applicant has also entered into an Air Quality Mitigation Settlement Agreement with SJVAPCD that includes an air quality improvement program (GWF2009a). Beyond the requirements identified by the PDOC dated April 2, 2009 or the FDOC dated August 18, 2009, GWF and the SJVAPCD agreed on March 19, 2009 to have GWF provide an additional $319,000 in a mitigation fee. The mitigation fee would be used to implement measures selected by the SJVAPCD including: heavy-duty engine retrofit/replacement and agricultural engine replacement programs, with a preference to programs in or near the City of Tracy, San Joaquin County, and the Northern Region of the San Joaquin Valley Air Basin, in that order. The SJVAPCD views the agreement and the air quality improvement program as a community benefit.

The agreement is not designed to provide CEQA mitigation (SJVAPCD2009b). Staff does not formally recommend or oppose this agreement, which staff considers to be separate from this CEQA process, as this agreement is not considered necessary under staff's CEQA findings.

Emission Controls

The combustion turbines limit NOx formed during combustion using dry low-NOx (DLN) combustors. Compared to steam or water-injection designs, combustors designed for low-NOx firing maintain low temperatures, thus minimizing NOx formation, while thermal efficiencies remain high. To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, would be installed in the new HRSGs. GWF proposes to install two new, more efficient catalyst systems for each combustion turbine: the SCR system to reduce NOx; and the oxidation catalyst system to reduce CO and VOC. Operating exclusively on pipeline quality natural gas limits SOx and particulate matter emissions.

The other stationary sources would also be limited. By using an air cooled condenser (dry cooling design), the cooling system for the new combined-cycle project would not include a large cooling tower, which would otherwise be a source of particulate matter drift or mist. The new auxiliary boiler would include ultra low-NOx burners to achieve the District's limits. The existing standby generator engine meets U.S. EPA Tier 2 standards, and the new fire pump engine would achieve the equivalent of the more-stringent U.S. EPA Tier 3 standards. Non-emergency hours of operation would be limited to 50 hours or less per year.

Emission Offsets

In addition to emission control strategies included in the project design, GWF Tracy proposes to rely upon emission reduction credits (ERCs) surrendered in 2003 and two valid ERCs for CO and SOx (N-320-3 and N-575-5) to offset new emissions. SJVAPCD Rule 2201 requires GWF to offset any net emissions increases of NOx, VOC, and PM10 based on a comparison of the pre-project and post-project potential-to-emit (SJVAPCD2009d). This requirement was in place at the time of the original TPP licensing, and the original TPP was permitted to emit much greater quantities of NOx than the current proposal for the combined-cycle project. As a result of the requirements in Rule 2201 and the original Energy Commission Conditions of Certification for TPP, mitigation was provided in the form of offsets for the originally permitted TPP emission limits. The SJVAPCD considers each of the existing TPP turbines to be a "Clean Emission Unit" and finds that no new offsets would be required by Rule 2201 for the proposed project's NOx emissions and that, by reducing the potential emissions of NOx, the proposed project would create a "netting" action so that no additional SJVAPCD emission reduction credits would need to be surrendered for VOC or PM10 (SJVAPCD2009d). The two valid ERCs for CO and SOx would be used by GWF voluntarily because the SJVAPCD does not require offsets for CO or SOx under Rule 2201.

Air Quality Table 20 summarizes the proposed mitigation for GWF Tracy, which relies completely on the mitigation provided when the TPP was originally permitted. The mitigation provided for the original TPP is summarized in **Air Quality Setting Tables**

10a to 10e. The SJVAPCD and the Energy Commission required the surrender of emission reduction credits for all original TPP potential emissions. Because the original TPP was recently fully offset, GWF's proposed mitigation for the combined-cycle project is already in place.

Air Quality Table 20
GWF Tracy, Mitigation of Proposed Emissions (lb)

Source / Reduction	ERC Number	NOx	VOC	PM10/ PM2.5	CO	SOx
Proposed GWF Tracy Annual Emissions	---	180,572	31,997	66,995	161,858	14,406
Existing TPP Mitigation Offsets Provided	See AQ Tables 10a-10e	300,360	32,080	93,392	143,240	11,200
18800 Spreckels Blvd, Manteca	N-320-3	---	---	---	214,416	---
800 W. Church St, Stockton	N-575-5	---	---	---	---	200,000
Surplus (Deficit)		119,788	83	26,397	195,798	196,794
Fully Offset?		Yes	Yes	Yes	N/A [a]	Yes

Sources: Energy Commission, Compliance Record for TPP (01-AFC-16C); AFC Section 5.1.6.2.1 and Response to DR13.
Notes: a. Proposed emissions of CO would not contribute to a significant impact and, therefore, would not require mitigation.

Emission Offsets for Ozone Impact

Both NOx and VOC emissions are recognized precursors to the formation of ambient ozone, and NOx is also a recognized precursor to the formation of the nitrate fraction of fine particulate matter. The ERCs surrendered in 2003 were for a face value of sufficient NOx and VOC reductions to exceed the currently proposed potential emissions for the combined-cycle project. The original ERCs help to avoid for the potential environmental impacts caused by GWF Tracy, but they are not usable for any other purpose or any other project because they were made invalid for future District transactions when GWF surrendered them. Staff's full discussion of how the proposed project satisfies District requirements is found in **AIR QUALITY COMPLIANCE WITH LORS**. As shown in **Air Quality Table 20**, mitigation provided by GWF for TPP's NOx and VOC provided sufficient reductions to offset proposed emission increases of these ozone precursors.

According to the FDOC, GWF would be in compliance with the District's NOx and VOC offset requirements. This Staff Assessment shows that the overall total existing TPP mitigation was provided at an offset ratio of greater than one-to-one, which satisfies the mitigation requirements for ozone impacts as established by Energy Commission staff.

Emission Offsets for Particulate Matter Impact

Air Quality Table 20 summarizes how existing TPP mitigation would apply to the combined-cycle project PM10/PM2.5 impacts. The ERCs surrendered in 2003 were for a face value of sufficient PM10 reductions to exceed the currently proposed potential

emissions for the combined-cycle project. Mitigation provided by GWF for TPP's PM10 provided sufficient reductions to offset proposed emission increases of PM10, and proposed emission increases of SOx would be offset by mitigation provided by GWF for TPP's PM10 and NOx. GWF additionally proposes to surrender offsets of SOx represented by a valid ERC (N-575-5) in order to ensure total mitigation of this precursor to PM10/PM2.5. Staff proposes a Condition of Certification (**AQ-SC7**) to ensure that all potential increases of SOx are offset with the valid ERC.

The proposed project would substantially reduce the potential NOx emissions from the existing TPP turbines, and the District values this reduction by considering an interpollutant offset ratio (District Rule 2201, Section 4.13.3). NOx is a notable precursor of PM10 and PM2.5 formation because it reacts with ammonia to form ammonium nitrates. The SJVACPD can approve interpollutant trading ratios on a case-by-case basis, and the FDOC establishes a ratio of 2.629-to-one for NOx reductions-to-PM10 increases. Although the discussion above describes how TPP's PM10 mitigation was sufficient to offset the proposed project's PM10, the interpollutant analysis from the SJVAPCD is an additional justification that the historic NOx reductions would be sufficient to offset PM10/PM2.5 impacts. The current Rule 2201 requirements for PM10 increases are discussed further in **AIR QUALITY COMPLIANCE WITH LORS**.

According to the FDOC, GWF would be in compliance with the District's PM10 offset requirements. This Staff Assessment shows that the overall total existing TPP mitigation for PM10/PM2.5 precursors was provided at an offset ratio of greater than one-to-one, which satisfies the mitigation requirements for particulate matter impacts as established by Energy Commission staff.

Adequacy of Proposed Mitigation

Energy Commission staff have long held that emission reductions need to be provided for all nonattainment pollutants and their precursors at a minimum overall one-to-one ratio of annual operating emissions. For this project, the overall mitigation provided for TPP's potential ozone and particulate matter impacts would exceed that minimum offsetting goal for the ozone and particulate matter impacts due to the combined-cycle project. The offsets shown in **Air Quality Tables 10a to 10e** and **Air Quality Table 20** were in quantities sufficient to offset the project's proposed NOx, VOC, PM10/PM2.5, and SOx emissions, per District requirements and Energy Commission staff's criterion for determining significance. The offset package would mitigate all project air quality impacts to a less than significant level.

Staff's review of the offset package was determined solely based on the merits of this case, including the District offset requirements, the project's emission limits, the specific ERCs involved, and ambient air quality considerations of the region, and does not in any way provide a precedence or obligation for the acceptance of offset proposals for any other current or future licensing cases.

Staff Proposed Mitigation

Staff proposes Conditions of Certification **AQ-SC6, AQ-SC7,** and **AQ-SC8** to ensure that the license is amended as necessary to incorporate changes to the air quality

permits, to ensure that GWF's proposed offsets for CO and SOx are surrendered, and to ensure ongoing compliance through quarterly reports, respectively.

Cumulative Impacts and Mitigation

"Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, §15355). Such impacts can be relatively minor and incremental yet still be significant because of the existing environmental background, particularly when considering other closely related past, present, and reasonably foreseeable future projects.

Criteria pollutants have impacts that are usually (though not always) cumulative by their nature. Rarely will a project itself cause a violation of a federal or state criteria pollutant standard. However, many new sources contribute to violations of criteria pollutant standards because of elevated background conditions. Air districts attempt to reduce background criteria pollutant levels by adopting attainment plans, which are multi-faceted programmatic approaches to attainment. Attainment plans typically include new source review requirements that provide offsets and use Best Available Control Technology, combined with more stringent emissions controls on existing sources.

The discussion of cumulative air quality impacts includes the following three analyses:

- A summary of projections for criteria pollutants by the air district and the air district's programmatic efforts to abate such pollution;
- An analysis of the project's "localized cumulative impacts" direct emissions locally when combined with other local major emission sources; and
- A discussion of greenhouse gas emissions and global climate change impacts (in **AIR QUALITY APPENDIX AIR-1**).

Summary of Projections

The federal and California Clean Air Acts direct local air quality management agencies to implement plans and programs that lead to attainment and maintenance of the ambient air quality standards. The New Source Review program administered by SJVAPCD and other programs for reducing emissions from mobile sources or area-wide sources, are part of air quality management plans.

Ozone

The **2004 Extreme Ozone Attainment Demonstration Plan** illustrates how the SJVAPCD would attain the federal 1-hour ozone standard that was revoked in 2005. This plan includes elements that are the foundation for later ozone plans.
The **2007 Ozone Plan** to attain the federal 8-hour ozone standard was approved by ARB on June 14, 2007. This plan would reduce ozone and particulate matter levels in the region, primarily by achieving a 75% reduction in NOx emissions by 2023. Achieving such dramatic reductions would affect all sectors of the region's economy (SJVAPCD 2007). The plan relies on four main approaches: tighter district regulations for stationary sources, wider use of incentive-based measures (like the Carl Moyer Program) to

accelerate deployment of cleaner sources, new “innovative” programs for trip-reduction and energy conservation, and expanded controls on mobile source tailpipe emissions.

The GWF Tracy project is subject to the current SJVAPCD rules and regulations that specify performance standards, offset requirements, and emission control requirements for stationary sources. The regulations also include requirements for obtaining Authority to Construct (ATC) permits and subsequent operating permits. These regulations assume that the planned improvements in air quality come from all sectors of the economy because they apply to the proposed project and all other projects with emission sources. In general, triennial updates of the attainment plans ensure that population, employment, and transportation trends in the region are taken into account, and compliance with SJVAPCD rules and regulations ensures consistency with the regional air quality management plans. However, the recently adopted plans and a changing regulatory environment raise the following concerns.

The SJVAPCD originally required GWF to surrender offsets to ensure that the Tracy Peaker Project caused “no net increase” to emissions in the region. Additionally, the existing TPP was built recently-enough to still meet the District’s current “Clean Emission Unit” standards. Since the proposed project would reduce the potential NOx emissions from the existing turbines, the GWF Tracy Combined Cycle Power Plant Project causes no net increase in potential NOx (p. 49, SJVAPCD2009d). The analysis of offset requirements for the project in the FDOC (p. 50, SJVAPCD2009d) uses the netting evaluation (based on a comparison of the pre-project and post-project potential-to-emit) combined with a debit transaction for VOC and PM10 in the District’s federal offset equivalency tracking system to satisfy the current offset requirements of Rule 2201. These actions together are sufficient to allow Energy Commission staff to conclude that GWF Tracy would not be likely to conflict with regional ozone attainment goals.

Particulate Matter

The **2007 PM10 Maintenance Plan** illustrates how the SJVAPCD intends to continue the efforts of the **2003 PM10 Plan** and **2006 PM10 Plan** that implemented aggressive PM10 controls in the region, including Reasonably Available Control Measures (RACM) for large existing sources of PM10 and fugitive dust. The 2007 PM10 Maintenance Plan includes a request for reclassification to “attainment” for the federal PM10 standard, and it provides for continued attainment for 10 year from the designation. In November 2008, the U.S. EPA redesignated the SJVAPCD to attainment for the federal PM10 standard (73 FR 66759, November 12, 2008).

The **2008 PM2.5 Plan** was adopted by the SJVAPCD Governing Board on April 30, 2008, and it includes measures for attaining the 1997 and 2006 federal PM2.5 standards. The 2008 PM2.5 Plan shows that emission reductions of NOx, directly emitted PM2.5, and SO_2 are needed to demonstrate attainment of the PM2.5 NAAQS in the San Joaquin Valley (p. 6-1 of plan).

Energy Commission staff raised concerns that GWF Tracy could interfere with the attainment effort of the 2007 PM10 Maintenance Plan and the 2008 PM2.5 Plan by relying on offsets originally surrendered for NOx in 2003 for the TPP. The SJVAPCD determined that by reducing potential emissions of NOx from the TPP, and by

conducting a debit transaction for VOC and PM10 in the District's federal offset equivalency tracking program that ensures offsetting occurs in a manner at least as stringent as the federal requirements, the project would comply with PM10 offset requirements (SJVAPCD2009d). With these actions, Energy Commission staff is able to conclude that GWF Tracy would not be likely to conflict with regional particulate matter attainment goals.

Localized Cumulative Impacts

The proposed project and other reasonably foreseeable projects could cause impacts that would be locally combined if present and future projects would introduce stationary sources that are not included in the "background" conditions. Reasonably foreseeable future projects are those that are either currently under construction or in the process of being approved by a local air district or municipality. Projects that have not yet entered the approval process do not normally qualify as "foreseeable" since the detailed information needed to conduct this analysis is not available. Sources that are presently operational are included in the background concentrations. Background conditions also take into account the effects of non-stationary sources.

Projects with stationary sources located up to six miles from the proposed project site usually need to be considered by the analysis. GWF requested that the SJVAPCD and the neighboring Bay Area Air Quality Management District (BAAQMD) identify potential new stationary sources within six miles (GWF Response to DR 15, CH2M2009b). The SJVAPCD reported 37 facilities with pending changes, with most having the potential to emit fewer than 10 pounds per day of any contaminant or exclusively VOC (GWF Table DR15-1). Although cumulative sources emitting exclusively VOC would contribute to the project-related impacts to secondary ozone formation, these impacts are not modeled in this Staff Assessment because there are no agency-recommended models or procedures for quantifying the cumulative ozone impacts.

The requests made on behalf of the Energy Commission staff by GWF to the SJVAPCD and BAAQMD for sources to be included cumulative dispersion modeling analysis identified the following new facilities and stationary sources (CH2M2009b):

- **Tesla Power Project.** The Tesla Power Project was approved by the Energy Commission in 2004 (01-AFC-21) for a site in Alameda County approximately 4.5 miles west of GWF Tracy, but construction has not started and an extension was not approved by the Commission. It was included in this Staff Assessment with all four proposed stationary gas combustion turbines in some phase of startup mode (one pair of CTGs emitting 379 lb/hr NOx combined plus the second pair of CTGs emitting 260 lb/hr NOx combined, for Tesla facility wide 640 lb/hr NOx), which overestimates the worst-case scenario emissions that would be allowed. Conditions limited the Tesla CTGs to a total of 331.3 lb/hr NOx combined. Each of the four CTGs at Tesla was included with worst-case PM10/PM2.5 emissions of 12.75 lb/hr, consistent with the assumption that they operate with duct firing.
- **Musco Olive Products.** Proposed bubbling fluidized bed boiler (13.1 MMBtu/hr) that would be fired on olive pits and located about two miles west of GWF Tracy was included in this analysis.

- **RMC Pacific Materials.** Proposed rock crusher/aggregate plant about four miles southeast of GWF Tracy was included.
- **Lawrence Livermore Laboratory.** Proposed internal combustion engine and outdoor explosives detonation activities about five miles south of GWF Tracy were included.

The maximum modeled cumulative impacts are presented below in **Air Quality Table 21**. The total impact is conservatively estimated by the maximum modeled impact plus existing maximum background pollutant levels.

Air Quality Table 21
GWF Tracy, Ambient Air Quality Impacts from Cumulative Sources (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	5.3	**126.8**	**132.1**	50	**264**
	Annual	0.6	**33.4**	**34**	20	**170**
PM2.5	24 hour	5.3	**85.3**	**90.6**	35	**259**
	Annual	0.6	**13.5**	**14.1**	12	**118**
CO	1 hour	1,040	5,039	6,079	23,000	26
	8 hour	132	2,634	2,766	10,000	28
NO_2	1 hour [a]	223.1	105	328	339	97
	Annual	1.54	18.8	20.3	57	36
SO_2	1 hour	12.5	47.1	59.6	655	9
	24 hour	0.9	18.3	19.2	105	18
	Annual	0.1	5.2	5.3	80	7

Sources: Data Response Set 1A Table DR15-4 (CH2M2009b). Short-term impacts include fire pump and emergency standby generator engine testing.
Notes: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output.

As with the impacts from GWF Tracy alone, maximum cumulative impacts are predicted to occur near the western fence line of the proposed project, and cumulative impacts at the closest residences, would also be similar to those caused by GWF Tracy alone, meaning that impacts from GWF Tracy would dominate the localized cumulative impacts.

The East Altamont Energy Center (EAEC) was not included in this analysis because it would be more than six miles from GWF Tracy. This was the approach in the applicant's filing for the original Tracy Peaker Project. The Energy Commission staff assessment released in January 2002 for the TPP provided a discussion of the different areas of impact. In that assessment, EAEC was found to cause up to 3.02 µg/m^3 PM10 on a 24-hr basis, in the elevated terrain west and west-southwest of the TPP site in eastern Alameda County, and up to 0.46 µg/m^3 PM10 annually (CEC 2002). The fate of the

EAEC is uncertain because although the Energy Commission extended the license to allow construction by 2011, the EAEC may no longer have a viable means for compliance with BAAQMD offset requirements (CH2M2009b).

Staff believes that particulate matter emissions from GWF Tracy would be cumulatively considerable because they would contribute to existing violations of the PM10 and PM2.5 ambient air quality standards. Secondary impacts would also be cumulatively considerable for PM10, PM2.5, and ozone because emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would contribute to existing violations of the PM10, PM2.5, and ozone standards. To address the contribution caused by GWF Tracy to cumulative particulate matter and ozone impacts, the mitigation provided for TPP would offset all nonattainment pollutants and their precursors at a minimum ratio of one-to-one.

COMPLIANCE WITH LORS

The Preliminary Determination of Compliance (PDOC) for GWF Tracy was dated April 2, 2009 (SJVAPCD2009a), and the Final Determination of Compliance (FDOC) was dated August 18, 2009. Compliance with all District Rules and Regulations was demonstrated to the District's satisfaction in the FDOC, and the FDOC conditions are presented in the Conditions of Certification. Staff and U.S. EPA provided comments on the PDOC to the District for their consideration (CEC2009a and USEPA2009a), and this Final Staff Assessment includes the revisions made by the District in response to the staff and U.S. EPA comments.

FEDERAL

The FDOC represents the federal nonattainment New Source Review (NSR) permit.

40 CFR 52.21, Prevention of Significant Deterioration. A PSD permit is not required for the GWF Tracy because the proposed project is neither a new major stationary source nor a major modification to an existing major source under the definitions of major source or major modification in the federal PSD rules. The GWF Tracy Combined Cycle Power Plant Project is not considered to be a new major stationary source for PSD since the proposed potential to emit would not exceed 100 tons per year for any PSD criteria pollutant. For all sources in the SJVAPCD, the PSD program is implemented by the U.S. EPA. Staff proposes Condition of Certification **AQ-SC6** to ensure that if, in the future, GWF proposes changes to the project that trigger PSD applicability, GWF would be required to amend the Energy Commission license for any PSD permit conditions.

40 CFR 60, NSPS Subpart KKKK. The existing CTGs, as they would be modified for combined-cycle operation, are likely to comply with the applicable emission limits by achieving a NOx emission rate of 2.0 ppmvd over any one-hour period except during startup and shutdown periods.

40 CFR 60, NSPS Subpart IIII. The new emergency fire water pump engine would be required to achieve 3.0 g/hp-hr NOx+NMHC per U.S. EPA Tier 3 standards, which

would be consistent with FDOC requirements. This standard does not apply to the existing emergency standby generator engine because the engine was installed before 2005.

STATE

GWF has demonstrated that the project would comply with Section 41700 of the California State Health and Safety Code, which restricts emissions that would cause nuisance or injury. Compliance with the FDOC (SJVAPCD2009d) and the Energy Commission staff's Conditions of Certification enable staff's affirmative finding.

LOCAL

The District issued the FDOC (SJVAPCD2009d) stating that the proposed project is expected to comply with all applicable District rules and regulations. The District rules and regulations specify the emissions control and offset requirements for new sources and the proposed emission increases. The project would use the Best Available Control Technology (BACT) as proposed by GWF and approved and certified by the District. To satisfy offset requirements, the project would rely on a netting evaluation combined with a debit transaction in the District's offset equivalency tracking system.

SJVAPCD Rules 2201 and 2301, New Source Review and Offsets. SJVAPCD offset requirements would be met by considering the "net" proposed changes in potential emissions and an interpollutant exchange of the reductions in potential NOx emissions for the currently proposed VOC and PM10/PM2.5 increases associated with the combined-cycle project. This proposal triggered the following major LORS compliance concerns.

Energy Commission staff raised concerns about using NOx ERCs surrendered in 2003 for current compliance with Rule 2201 (CEC2009a). The District confirmed in the FDOC that the original ERCs no longer exist for use in NSR compliance. Surrender of the original ERCs rendered them invalid for use in further District permitting.[1] This is because the original ERCs may have come from older sources that would be subject to more-stringent control today, and if the original ERCs were to be applied to the current project today, they could be subject to adjustment for consistency with applicable air district rules before being considered "surplus" today. For example, many of the ERCs were created by boiler or engine modifications that may today be required by rules promulgated for the 2007 Ozone Plan or any of the District's other recent aggressive rules to manage ozone or particulate matter (described in **AIR QUALITY SUMMARY OF PROJECTIONS**). A "surplus" adjustment would not be necessary for the GWF Tracy project because the original TPP was built recently-enough to meet the District's current "Clean Emission Unit" standards.[2] With this designation, District Rule 2201 allows the GWF Tracy Combined Cycle Power Plant Project to create a net decrease in its potential NOx emissions that in-turn allows satisfaction of the District offsetting requirements for proposed VOC and PM10 increases. GWF did not propose to "re-bank" any of the ERCs that were provided in 2003, and if it applied to do so, the District

1 The statement that ERCs become invalid upon surrender is made by the SJVAPCD in its letter to GWF Energy dated April 16, 2003 regarding the Tracy Peaker Power Plant (01-AFC-16).
2 The District Rule 2201 definition for "Clean Emission Unit" is separate and distinct from the federal term "Clean Unit" that was removed from 40 CFR 51.165 and 40 CFR 52.21 by a court action in 2007.

would only be able to issue ERCs for reductions that are real and surplus (if any). The interpollutant netting action avoids the District using the original NOx offsets or determining whether they are surplus. This satisfies District rules. A separate transaction to debit VOC and PM10 from the District's "offset equivalency tracking system" was necessary for the District's netting to satisfy U.S. EPA requirements. Staff notes that future projects may be subject to offset requirements and interpollutant trading ratios different from those used here because the U.S. EPA review of the SJVAPCD's 2008 PM2.5 plan is ongoing.

Staff also recommended that the District's analysis of BACT address minimizing startup emissions or startup durations (CEC2009a). The FDOC includes a BACT analysis of startup and shutdown emissions. Permit conditions would require early ammonia injection (**AQ-26** and **AQ-27**), which is appropriate for this proposed project and the existing combustion turbines.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Agency and public comments made to the Energy Commission after release of the Preliminary Staff Assessment were limited. The CEQA staff at the SJVAPCD reviewed the PSA and provided no comment (SJVAPCD2009c). The applicant provided comments to staff (CH2M2009f), and this staff assessment incorporates the necessary revisions. Neighboring property owners raised the following issues during the Energy Commission's PSA workshop in June 2009 and in written comments (Tuso2009a).

- **GWF Tracy will cause increased emissions and worsen existing conditions.** Response: As described in the **Setting**, the existing air quality in the entire San Joaquin Valley fails to meet and presently violates various standards that are protective of public health. This assessment shows how GWF Tracy would contribute to those existing violations by causing locally-increased concentrations (**Air Quality Tables 17, 18, and 21**). Staff considers the impacts to be potentially significant, warranting mitigation. Given the historically poor air quality, the region-wide air quality management strategy is one of "no net increases." Some communities experience local emission increases while other San Joaquin Valley communities experience the reductions, but all regional improvements are relevant to Tracy because of the shared nature of the air basin. Offsets originally provided for the Tracy Peaker Project (**Air Quality Tables 10a to 10c**) and those required by this analysis (**AQ-SC7**) are mostly from Tracy and communities within 25 miles of Tracy including Stockton and Manteca. These reductions mitigate the changes in air quality that would be caused by the proposed combined-cycle project.

- **GWF Tracy will reduce air quality, which in turn reduces the quality of life for neighbors.** Response: This assessment gives the worst-case scenario of how air pollutant concentrations could change as a result of the project (**Air Quality Tables 17, 18, and 21**). Compared to the highest background conditions occurring without the project, particulate matter concentrations during construction could increase by less than 5% at the nearest residence (adding 5 $\mu g/m^3$ to background conditions of 126.8 $\mu g/m^3$, PM10, 24-hour basis). The change would be less than 1% during routine operation of the proposed combined-cycle project. While these increases in air pollutants would affect the surroundings, the mitigation identified in this

assessment and the recommended Conditions of Certification ensure that the impacts would be reduced to less than significant levels.

CONCLUSIONS

Construction impacts would contribute to violations of the ozone, PM10, and PM2.5 ambient air quality standards. Staff recommends Conditions of Certification **AQ-SC1** to **AQ-SC5** to mitigate the project construction-phase impacts to a less than significant level.

Operation of the GWF Tracy project is likely to conform with applicable SJVAPCD rules and regulations, including New Source Review requirements, offset requirements, and Best Available Control Technology (BACT) requirements.

The project would neither cause new violations of any NO_2, CO, or SO_2 ambient air quality standards nor contribute to existing violations for these pollutants. Therefore, the project's direct NO_2, CO, and SO_2 impacts are less than significant.

The project NOx and VOC emissions would contribute to existing violations of state and federal ozone ambient air quality standards. The ozone precursor offsets originally provided for the Tracy Peaker Project were in sufficient quantity to offset the proposed project's NOx and VOC emissions and mitigate the ozone impact to a less than significant level.

The project PM10 and PM2.5 emissions and the PM10/PM2.5 precursor emissions of SOx would contribute to the existing violations of state and federal PM10 and PM2.5 ambient air quality standards. The PM10, SOx, and NOx offsets originally provided for the Tracy Peaker Project were in sufficient quantity to offset the proposed project's particulate matter emissions and to mitigate the PM10/PM2.5 impacts to a less than significant level.

The applicant, separate from the Energy Commission review of GWF Tracy, independently agreed to fund an additional air quality improvement program that will be paid to and administered by the SJVAPCD. However, staff considers the agreement to be separate from this CEQA process.

Global climate change and greenhouse gas (GHG) emissions from the project are discussed and analyzed in **AIR QUALITY APPENDIX AIR-1**. The GWF Tracy project could comply with the limits of SB 1368 and the Emission Performance Standard. Mandatory reporting of the GHG emissions is required as part of the Air Resources Board's greenhouse gas regulations, and this may enable the ARB to implement trading markets (see **AIR QUALITY APPENDIX AIR-1**). The project may be subject to additional reporting requirements and GHG reduction or trading requirements as GHG regulations become more fully developed and implemented.

PROPOSED CONDITIONS OF CERTIFICATION

STAFF-RECOMMENDED CONDITIONS OF CERTIFICATION

Staff proposes the following conditions of certification (identified as the **AQ-SCx** series of conditions) to provide mitigation during the construction phase of the project.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with conditions **AQ-SC3, AQ-SC4** and **AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM delegates. The AQCMM and AQCMM delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the construction project manager (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, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM delegates. The AQCMM and all delegates must be approved by the CPM before the start of ground disturbance.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide, for approval, an AQCMP that details the steps to be taken and the reporting requirements necessary to ensure compliance with conditions of certification **AQ-SC3, AQ-SC4** and **AQ-SC5**.

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

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each monthly compliance report (MCR) that demonstrates compliance with the following mitigation measures for purposes of preventing all fugitive dust plumes from leaving the project site and linear facility routes. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

A. All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust mitigation objectives of **AQ-SC4**. The frequency of watering may be either reduced or eliminated during periods of precipitation.

B. No vehicle shall exceed 15 miles per hour within the construction site.

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

D. All construction equipment vehicle tires shall be inspected and washed as necessary to be 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 unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

G. All construction vehicles shall enter the construction site through the treated entrance roadways unless an alternative route has been submitted to and approved by the CPM.

H. Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.

I. All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

J. At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or run-off from the construction site is visible on the public roadways.

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

L. All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks to provide at least two feet of freeboard.

M. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The project owner shall include in the MCR: (1) a summary of all actions taken to maintain compliance with this condition; (2) copies of any complaints filed with the air district in relation to project construction; and (3) any other

documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes with the potential to be transported off the project site, 200 feet beyond the centerline of the construction of linear facilities, or within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not providing effective mitigation. The AQCMM or delegate shall then implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed.

Step 1: The AQCMM or delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or delegate shall direct implementation of additional methods of dust suppression if Step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2 specified above fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMP shall include a section detailing how additional mitigation measures will be accomplished within specified time limits.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the MCR, a construction mitigation report that demonstrates compliance with the following mitigation measures for purposes of controlling diesel construction-related emissions. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

A. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

B. All construction diesel engines with a rating of 100 hp or higher shall meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless certified by the on-site

AQCMM that such engine is not available for a particular item of equipment. In the event that a Tier 2 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a Tier 1 engine. In the event a Tier 1 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a diesel particulate filter (DPF) unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is "not practical" for the following, as well as other, reasons.

1. There is no available DPF that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency for the engine in question; or

2. The construction equipment is intended to be on site for 10 days or less.

3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not possible.

C. The use of a soot filter may be terminated immediately if one of the following conditions exists, provided that the CPM is informed within 10 working days of the termination:

1. The use of the soot filter is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.

2. The soot filter is causing or is reasonably expected to cause significant engine damage.

3. The soot filter is causing or is reasonably expected to cause a significant risk to workers or the public.

4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

D. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (b) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

E. All diesel heavy construction equipment shall not idle for more than five minutes, to the extent practical.

Verification: The project owner shall include in the MCR: (1) a summary of all actions taken to maintain compliance with this condition; (2) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that the equipment has been properly maintained; and (3) any

other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. EPA, and any revised permit issued by the District or U.S. EPA, for the project.

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-SC7 The project owner shall surrender to the San Joaquin Valley Air Pollution Control District emission reductions in the form of offsets or emission reduction credits (ERCs) as calculated per SJVAPCD Rule 2201 to offset CO and SOx emissions, as proposed by the applicant.

The project owner shall surrender the ERCs from among those listed below or a modified list, as allowed by this condition. If additional ERCs are submitted, the project owner shall submit an updated table including the additional ERCs to the CPM. The project owner shall request CPM approval for any substitutions, modifications, or additions to the listed credits.

Source / Reduction	ERC Number	CO (lb)	SOx (lb)
18800 Spreckels Blvd, Manteca	N-320-3	18,618	---
800 W. Church St, Stockton	N-575-5	---	3,206

The CPM, in consultation with the District, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards, and that the requested change(s) will not cause the project to result in a significant environmental impact. The District must also confirm that each requested change is consistent with applicable federal and state laws and regulations.

Verification: The project owner shall submit to the CPM records showing that the project's offset requirements have been met prior to initiating construction. If the CPM approves a substitution or modification to the list of ERCs, the CPM shall file a statement of the approval with the project owner and Commission docket. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC8 The project owner shall submit to the CPM quarterly operation reports that include operational and emissions information as necessary to demonstrate compliance with the conditions of certification. The quarterly operation report shall specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit quarterly operation reports to the CPM and APCO no later than 30 days following the end of each calendar quarter. This information shall be maintained on site for a minimum of five years and shall be provided to the CPM and District personnel upon request.

DISTRICT FINAL DETERMINATION OF COMPLIANCE CONDITIONS (SJVAPCD2009D)

The SJVACPD permits each device separately, which causes duplication of conditions. Staff has compiled the SJVAPCD conditions to eliminate this duplication, with the conditions first for each of the two units in the combined-cycle system (**AQ-1** to **AQ-75**) and facility-wide conditions (**AQ-76** to **AQ-101**), followed by the conditions for, the emergency standby generator engine (**AQ-102** to **AQ-118**), the auxiliary boiler (**AQ-119** to **AQ-151**), and the fire water pump engine (**AQ-152** to **AQ-170**).

EQUIPMENT DESCRIPTION, UNIT N-4597-1-5

MODIFICATION OF AN EXISTING 84.4 MW NOMINALLY RATED SIMPLE-CYCLE PEAK-DEMAND POWER GENERATING SYSTEM #1 CONSISTING OF A GENERAL ELECTRIC MODEL PG 7121 EA NATURAL GAS-FIRED COMBUSTION TURBINE GENERATOR SERVED BY AN INLET AIR FILTRATION AND COOLING SYSTEM, DRY LOW-NOX COMBUSTORS, A SCR SYSTEM WITH AMMONIA INJECTION, AND AN OXIDATION CATALYST: TO CONVERT THE EXISTING SYSTEM TO A COMBINED CYCLE CONFIGURATION BY (1) REMOVING THE EXISTING OXIDATION AND SELECTIVE CATALYTIC REDUCTION SYSTEM AND THE EXISTING 100 FOOT EXHAUST STACKS, (2) INSTALLING A NEW HEAT RECOVERY STEAM GENERATOR EQUIPPED WITH A 324 MMBTU/HR (HHV) NATURAL GAS-FIRED DUCT BURNER, (3) INSTALLING A NEW OXIDATION CATALYST AND NEW SELECTIVE CATALYTIC REDUCTION SYSTEM, (4) INSTALLING A NEW 150’ TALL 17’ DIAMETER STACK, (5) INSTALLING A NEW STG LUBE OIL COOLER, AND (6) INSTALLING A 145 MW NOMINALLY RATED CONDENSING STEAM TURBINE GENERATOR (SHARED WITH N-4597-2)

EQUIPMENT DESCRIPTION, UNIT N-4597-2-6

MODIFICATION OF AN EXISTING 84.4 MW NOMINALLY RATED SIMPLE-CYCLE PEAK-DEMAND POWER GENERATING SYSTEM #2 CONSISTING OF A GENERAL ELECTRIC MODEL PG 7121 EA NATURAL GAS-FIRED COMBUSTION TURBINE GENERATOR SERVED BY AN INLET AIR FILTRATION AND COOLING SYSTEM, DRY LOW-NOX COMBUSTORS, A SCR SYSTEM WITH AMMONIA INJECTION, AND AN OXIDATION CATALYST: TO CONVERT THE EXISTING SYSTEM TO A COMBINED CYCLE CONFIGURATION BY (1) REMOVING THE EXISTING OXIDATION AND SELECTIVE CATALYTIC REDUCTION SYSTEM AND THE EXISTING 100 FOOT EXHAUST STACKS, (2) INSTALLING A NEW HEAT RECOVERY STEAM GENERATOR EQUIPPED WITH A 324 MMBTU/HR (HHV) NATURAL GAS-FIRED DUCT BURNER, (3) INSTALLING A NEW OXIDATION CATALYST AND NEW SELECTIVE CATALYTIC REDUCTION SYSTEM, (4) INSTALLING A NEW 150’ TALL 17’ DIAMETER STACK, (5) INSTALLING A NEW STG LUBE OIL COOLER, AND (6) INSTALLING A 145 MW NOMINALLY RATED CONDENSING STEAM TURBINE GENERATOR (SHARED WITH N-4597-1)

AQ-1 The owner/operator 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 make the site available for inspection by representatives of the District, ARB, and the Commission upon request.

AQ-2 To the extent this Determination of Compliance serves as an Authority to Construct, said Authority to Construct shall not become effective until the California Energy Commission approves the Application for Certification. [California Environmental Quality Act and District Rule 2201, Section 5.8.8]

Verification: No verification necessary.

AQ-3 This Determination of Compliance serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule]

Verification: No verification necessary.

AQ-4 Prior to operating with modifications authorized by this Determination of Compliance, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4]

Verification: The project owner shall submit to both the District and CPM the Title V Operating Permit application prior to operation.

AQ-5 The owner/operator of GWF Tracy shall minimize the emissions from the gas turbine to the maximum extent possible during the commissioning period. Conditions # 6 through #16 (**AQ-6** through **AQ-16**) shall apply only during the commissioning period as defined below. Unless otherwise indicated, conditions #17 through #101 (**AQ-17** through **AQ-101**) shall apply after the commissioning period has ended. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-11**.

AQ-6 Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning and calibration activities recommended by the equipment manufacturers and the GWF Tracy construction contractor to insure safe and reliable steady state operation of the gas turbine, heat recovery steam generators, steam turbine, and associated electrical delivery systems. [District Rule 2201]

Verification: No verification necessary.

AQ-7 Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when the gas turbine is first fired (at the beginning of the conversion to a combined cycle plant), whichever occurs first. The commissioning period shall terminate when the plant has completed initial

performance testing, completed final plant tuning, and is available for commercial operation. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-11**.

AQ-8 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 submit to the CPM and APCO for approval the commissioning plan as required in **AQ-11**.

AQ-9 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 oxidation catalyst shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-11**.

AQ-10 Coincident with the steady state operation of the SCR system and the oxidation catalyst at loads greater than 50% and after installation and tuning of emission controls, NOx, CO, and VOC emissions from this unit shall comply with the limits specified in conditions #30 and #31 (**AQ-30** and **AQ-31**) of this permit. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-11**.

AQ-11 The owner/operator shall submit a plan to the District at least four weeks prior to first firing of this unit (after beginning of the conversion to a combined cycle plant), 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 each activity. The activities described shall include, but not limited to, the tuning of the combustors, the installation and operation of the SCR system and oxidation catalyst, the installation, calibration, and testing of NOx and CO continuous emission monitors, and any activities requiring firing of this unit without abatement by the SCR system or oxidation catalyst. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan at least four weeks prior to the first operation of the stationary gas turbines.

AQ-12 Emission rates from the CTG, during the commissioning period, shall not exceed any of the following limits: NOx (as NO2) – 146.70 lb/hr; PM10 – 5.80 lb/hr; VOC (as methane) – 3.20 lb/hr; CO – 229.60 lb/hr; SOx (as SO2) – 2.6 lb/hr. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-13 During the initial commissioning activities, the owner/operator shall demonstrate compliance with the NOx emission limit specified in condition #12 (**AQ-12**) through the use of properly operated and maintained continuous emission monitor located within the inlet section of the steam generator unit. Upon completion of the initial commission activities and with the installation of the SCR system and oxidation catalyst, the owner/operator shall demonstrate compliance with the NOx and CO emission limits specified in conditions #30, #31, #32, and #33 (**AQ-30**, **AQ-31**, **AQ-32**, and **AQ-33**) through the use of properly operated and maintained continuous emission monitors and recorders as specified in conditions #55 and #56 (**AQ-55** and **AQ-56**). The monitored parameters for this unit shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation). [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-14 During initial commissioning activities, the inlet NOx continuous emissions monitor specified in this permit shall be installed, calibrated, and operation prior to the first re-firing of this unit. Upon completion of the initial commissioning activities and the installation of the SCR system and oxidation catalyst, the exhaust stack NOx and CO continuous monitors specified within this permit shall be installed, calibrated, and operational prior to the first re-firing of this unit with the SCR and oxidation catalyst in place. After the first re-firing, the detection range of each continuous emissions monitor shall be adjusted as necessary to accurately measure the resulting range of NOx and/or CO emission concentrations. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-11**.

AQ-15 The total number of firing hours of this unit without abatement of emissions by the SCR system and the oxidation catalyst shall not exceed 500 hours total during the commissioning period. Such operation of the unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and oxidation catalyst in place. Upon completion of these activities, the owner/operator shall provide written notice to the District and the unused balance of the 500 firing hours without abatement shall expire. Records of the commissioning hours for this unit shall be maintained. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-16 The total mass emissions of NOx, SOx, PM10, CO, and VOC that are emitted during the commissioning period shall accrue towards the consecutive twelve month emission limit specified in condition #41 (**AQ-41**). [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-17 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner shall submit the results of source tests to both the District and CPM in accordance with **AQ-50**.

AQ-18 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-19 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

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

AQ-20 Owner/operator 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, 6.1]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-21 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, 7.0]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-22 All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]

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

AQ-23 The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. [District Rule 4102]

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

AQ-24 Combustion turbine generator (CTG) and electrical 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 and 4101]

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

AQ-25 A selective catalytic reduction (SCR) system and an oxidation catalyst shall serve this gas turbine engine. Exhaust ducting may be equipped (if required) with a fresh air inlet blower to be used to lower the exhaust temperature prior to inlet of the SCR system catalyst. The owner/operator shall submit SCR and oxidation catalyst design details to the District at least 30 days prior to commencement of construction. [District Rule 2201]

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

AQ-26 During all types of operation, including startup and shutdown periods, ammonia injection in to the SCR system shall occur once the minimum temperature at the catalyst face has been reached to ensure NO_X emission reductions can occur with a reasonable level of ammonia slip. The minimum catalyst face temperature shall be determined during the final design phase of this project and shall be submitted to the District at least 30 days prior to commencement of construction. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-27 The SCR system shall be equipped with a continuous temperature monitoring system to measure and record the temperature at the catalyst face. [District Rule 2201]

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

AQ-28 Owner/operator shall submit continuous emission monitor design, installation, and operational details to the District at least 30 days prior to commencement of construction. [District Rule 2201]

Verification: The project owner shall provide a Continuous Emission Monitoring System (CEM) design plan for approval by the APCO and CPM at least 30 days prior to commencement of construction.

AQ-29 The CTG shall only be fired on PUC-regulated natural gas with a sulfur content value not exceeding 0.66 grains of sulfur compounds (as S) per 100 dry standard cubic feet on a daily basis and 0.25 grains of sulfur compounds (as S) per 100 dry standard cubic feet on a 12-month rolling average basis. [District Rule 2201 and 40 CFR 60.4330(a)(2)]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-30 Emission rates from this CTG without the duct burner firing, except during startup and shutdown periods, shall not exceed any of the following limits: NO_X (as NO_2) – 8.10 lb/hr and 2.0 ppmvd @ 15% O_2; CO – 3.90 lb/hr and 2.0 ppmvd @ 15% O_2; VOC (as methane) – 1.13 lb/hr and 1.5 ppmvd @ 15% O_2; PM_{10} – 4.40 lb/hr; or SO_X (as SO_2) – 2.03 lb/hr. NO_X (as NO_2) emission rates are one hour rolling averages. All other emission rates are three hour rolling averages. [District Rules 2201 and 4703 and 40 CFR 60.4320(a) & (b)]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-31 Emission rates from this CTG with the duct burner firing, except during startup and shutdown periods, shall not exceed any of the following limits: NO_X (as NO_2) – 10.30 lb/hr and 2.0 ppmvd @ 15% O_2; CO – 6.00 lb/hr and 2.0 ppmvd @ 15% O_2; VOC (as methane) – 3.22 lb/hr and 2.0 ppmvd @ 15% O_2; PM_{10} – 5.80 lb/hr; or SO_X (as SO_2) – 2.63 lb/hr. NO_X (as NO_2) emission rates are one hour rolling averages. All other emission rates are three hour rolling averages. [District Rules 2201 and 4703 and 40 CFR 60.4320(a) & (b)]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-32 During start-up, CTG exhaust emission rates shall not exceed any of the following limits: NO_X (as NO_2) – 390.5 lb/event; CO – 562.5 lb/event; VOC (as methane) – 10.5 lb/event; PM_{10} – 11.0 lb/event; or SO_X (as SO_2) – 4.1 lb/event. [District Rules 2201 and 4703]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-33 During shutdown, CTG exhaust emission rates shall not exceed any of the following limits: NO_X (as NO_2) –104.0 lb/event; CO – 148.0 lb/event; VOC (as methane) – 2.6 lb/event; PM_{10} – 3.0 lb/event; or SO_X (as SO_2) – 1.1 lb/event. [District Rules 2201 and 4703]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-34 A start up event is defined as the period beginning with the gas turbine initial firing until the unit meets the lb/hr and ppmvd emission limits in Condition 30 (**AQ-30**) or Condition 31 (**AQ-31**) depending on the operating conditions of the duct burners during the start up event. A shutdown event is defined as the period beginning with the turbine shutdown sequence and ending with the cessation of firing the gas turbine engine. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the District and CPM the CTG startup and shutdown event duration data demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-35 The duration of each startup shall not exceed three hours. Startup and shutdown emissions shall be counted toward all applicable emission limits. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the District and CPM the CTG startup and shutdown event duration data demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-36 The duration of each shutdown shall not exceed two hours. Startup and shutdown emissions shall be counted toward all applicable emission limits. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the District and CPM the CTG startup and shutdown event duration data demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-37 The emission control systems shall be in operation and emissions shall be minimized insofar as technologically feasible during startup and shutdown. [District Rule 4703]

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

AQ-38 The ammonia (NH_3) emissions shall not exceed 5 ppmvd @ 15% O_2 or 9.40 lb/hr over a 24 hour rolling average. [District Rules 2201 and 4102]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-39 Compliance with the ammonia emission limits 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 owner/operator shall submit a detailed calculation

protocol for District approval at least 60 days prior to commencement of operation; 3.) Alternatively, the owner/operator may utilize a continuous in-stack ammonia monitor to verify compliance with the ammonia emissions limit. If this option is chosen, the owner/operator shall submit a monitoring plan for District approval at least 60 days prior to commencement of operation. [District Rules 2201 and 4102]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-40 Daily emissions from the CTG shall not exceed the following limits: NO_X (as NO_2) – 814.9 lb/day; CO – 1071.6 lb/day; VOC – 78.6 lb/day; PM_{10} – 132.0 lb/day; or SO_X (as SO_2) – 58.7 lb/day. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-41 Annual emissions from the CTG, calculated on a twelve consecutive month rolling basis, shall not exceed any of the following limits: NO_X (as NO_2) – 88,881 lb/year; CO – 74,598 lb/year; VOC – 15,145 lb/year; PM_{10} – 32,250 lb/year; or SO_X (as SO_2) – 7,084 lb/year. Compliance with the annual NOx and CO emission limits shall be demonstrated using CEM data and compliance with the annual VOC, PM10 and SOx emission limits shall be demonstrated using the most recent source test results. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-42 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 rolling 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. [District Rule 2201]

Verification: No verification necessary.

AQ-43 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: No verification necessary.

AQ-44 The combined natural gas fuel usage for permit units N-4597-1 and N-4597-2 shall not exceed 20,454 MMscf/year. [District Rule 2550]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-45 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 NO_X, CO, and O_2 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: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission upon request.

AQ-46 Source testing to measure the steady state NOx, CO, VOC, and NH3 emission rates (lb/hr and ppmvd @ 15% O2) shall be conducted within 60 days after the end of the commissioning period and at least once every twelve months thereafter. [District Rules 1081, 2201 and 4703 and 40 CFR 60.4400]

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a pre-approved protocol (**AQ-50**). Testing for steady operation shall be conducted upon initial operation and at least once every twelve months.

AQ-47 Source testing to measure the PM10 emission rate (lb/hr) shall be conducted within 60 days after the end of the commissioning period and at least once every twelve months thereafter. [District Rule 1081, 2201 and 40 CFR 60.4400]

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a pre-approved protocol (**AQ-50**). Testing for steady operation shall be conducted upon initial operation and at least once every twelve months.

AQ-48 Source testing to measure startup and shutdown NOx, CO, and VOC mass emission rates shall be conducted for one of the gas turbines (N-4597-1 or N-4597-2) within 60 days after the end of the commissioning period and at least once every seven years thereafter. CEM relative accuracy for NOx and CO shall be determined during startup and shutdown source testing in accordance with 40 CFR 60, Appendix F (Relative Accuracy Audit). If CEM data is not certifiable to determine compliance with NO_X and CO startup emission limits, then startup and shutdown NOx and CO testing shall be conducted every 12 months. If an annual startup and shutdown NOx and CO relative accuracy audit demonstrates that the CEM data is certifiable, the startup and shutdown NOx and CO testing frequency shall return to the once every seven years schedule. [District Rule 1081 and 2201]

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

approved protocol (**AQ-50**). Testing for startup and shutdown emissions shall be conducted upon initial operation and at least once every seven years.

AQ-49 Any gas turbine with an intermittently operated auxiliary burner shall demonstrate compliance with the auxiliary burner both on and off. [District Rule 4703

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-50 Source testing shall be District witnessed, or authorized and samples shall be collected by a California Air Resources Board certified testing laboratory. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

Verification: The project owner shall submit the proposed source test plan or protocol for the source tests 15 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 30 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 60 days following the source test date to both the District and CPM.

AQ-51 The following test methods shall be used: NOx - EPA Method 7E or 20 or ARB Method 100 and EPA Method 19 (Acid Rain Program); CO - EPA Method 10 or 10B or ARB Method 100; VOC - EPA Method 18 or 25; PM10 - EPA Method 5 and 202 (front half and back half) or 201a and 202; ammonia - BAAQMD ST-1B; and O2 - EPA Method 3, 3A, or 20 or ARB Method 100. NOx testing shall also be conducted in accordance with the requirements of 40 CFR 60.4400(a)(2), (3), and (b). EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4703 and 40 CFR 60.4400(1)(i) and 40 CFR 60.4400(a)(2), (3), and (b)]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-52 Testing to demonstrate compliance with the short-term (daily) fuel sulfur content limit shall be conducted monthly. If a monthly test indicates that a violation of the daily fuel sulfur content limit has occurred then weekly testing shall commence and continue until eight consecutive tests show compliance. Once compliance with the daily fuel sulfur content is demonstrated on eight consecutive weekly tests, testing may return to the monthly schedule. If the unit is not operated during an entire calendar month, fuel sulfur content testing shall not be required for that specific month. [District Rule 2201 an 40 CFR 60.4360, 60.4365(a) and 60.4370(c)]

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the District and CPM in the quarterly operation report (**AQ-SC8**).

AQ-53 Compliance with the rolling 12-month average fuel sulfur content limit shall be demonstrated monthly. The 12-month rolling average fuel sulfur content shall be calculated as follows: 12-month rolling average fuel sulfur content = Sum of the monthly average fuel sulfur contents for the previous 12 months ÷ Total number of months the unit has operated in during the previous 12 months. The monthly average fuel sulfur content is the average fuel sulfur content of all tests conducted in a given month. If the unit is not operated during an entire calendar month, fuel sulfur content testing shall not be required for that specific month. Owner/operator shall keep a monthly record of the rolling 12-month average fuel sulfur content. [District Rules 1081 and 2201]

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the District and CPM in the quarterly operation report (**AQ-SC8**).

AQ-54 Fuel sulfur content shall be monitored using one of the following methods: ASTM Methods D1072, D3246, D4084, D4468, D4810, D6228, D6667 or Gas Processors Association Standard 2377. [40 CFR 60.4415(a)(1)(i)]

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the District and CPM in the quarterly operation report (**AQ-SC8**).

AQ-55 The CTG shall be equipped with a continuous monitoring system to measure and record fuel consumption. [District Rules 2201 and 4703]

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

AQ-56 The owner or operator shall install, certify, maintain, operate and quality-assure a Continuous Emission Monitoring System (CEMS) which continuously measures and records the exhaust gas NO_X, CO and O_2 concentrations. Continuous emissions monitor(s) shall monitor emissions during all types of operation, including during startup and shutdown periods, provided the CEMS passes the relative accuracy requirement for startups and shutdowns specified herein. If relative accuracy of CEMS cannot be demonstrated during startup conditions, CEMS results during startup and shutdown events shall be replaced with startup emission rates obtained from source testing to determine compliance with emission limits contained in this document. [District Rules 1080 and 4703 and 40 CFR 60.4335(b)(1)]

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

AQ-57 The CEMS shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period or shall meet equivalent specifications established by mutual agreement of the District, the ARB and the EPA. [District Rule 1080 and 40 CFR 60.4345(b)]

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

AQ-58 The NO_X, CO and O_2 CEMS shall meet the requirements in 40 CFR 60, Appendix F Procedure 1 and Part 60, Appendix B Performance Specifications 2, 3, and 4, and/or 40 CFR 75 Appendix A, or shall meet equivalent specifications established by mutual agreement of the District, the ARB, and the EPA. [District Rule 1080 and 40 CFR 60.4345(a)]

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

AQ-59 Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and compliance source testing are both 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 CEMS audits demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-60 The owner/operator shall perform a relative accuracy test audit (RATA) for NO_X, CO and O_2 as specified by 40 CFR Part 60, Appendix F, 5.11, or 40 CFR Part 75 Appendix B, at least once every four calendar quarters. The owner/operator 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. If the RATA test is conducted as specified in 40 CFR Part 75 Appendix B, the RATA shall be conducted on a lb/MMBtu basis. [District Rule 1080 and 40 CFR 60.4345]

Verification: The project owner shall submit to the CPM and APCO CEMS audits demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-61 APCO or an authorized representative shall be allowed to inspect, as determined to be necessary, the required monitoring devices to ensure that such devices are functioning properly. [District Rule 1080]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission to verify the monitoring devices are properly installed and operational.

AQ-62 The owner/operator shall develop and keep onsite a quality assurance plan for all the continuous monitoring equipment described in 40 CFR 60.4345(a), (c), and (d). [40 CFR 60.4345(e)]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission to verify the monitoring devices are properly installed and operational.

AQ-63 Results of the CEM system shall be averaged over a one hour period for NO_X emissions and a three hour period for CO emissions using consecutive 15-minute sampling periods in accordance with all applicable requirements of 40 CFR 60.13. [District Rule 4703 and 40 CFR 60.13 and 40 CFR 60.4350(a)]

Verification: The project owner shall submit to the District and CPM the report of emission data in the quarterly operation report (**AQ-SC8**) that follows the definitions of this condition.

AQ-64 The owner or operator shall, upon written notice from the APCO, provide a summary of the data obtained from the CEM systems. This summary shall be in the form and the manner prescribed by the APCO. [District Rule 1080]

Verification: The project owner shall submit to the District and CPM the report of CEM operations upon notice from the APCO.

AQ-65 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 (CEM) protocol for approval by the APCO and CPM at least 60 days prior to installation of the CEM. The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission upon request.

AQ-66 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-67 Excess NOx emissions shall be defined as any 30 day operating period in which the 30 day rolling average NOx concentration exceeds an applicable emissions limit. A 30 day rolling average NOx emission rate is the arithmetic average of all hourly NOx emission data in ppm measured by the continuous monitoring equipment for a given day and the twenty-nine unit operating days immediately preceding that unit operating day. A new 30 day average is calculated each unit operating day as the average of all hourly NOx emission rates for the preceding 30 unit operating days if a valid NOx emission rate is obtained for at least 75% of all operating hours. A period of monitor downtime

shall be any unit operating hour in which sufficient data are not obtained to validate the hour for either NOx or O2 (or both). [40 CFR 60.4350(h) and 40 CFR 60.4380(b)(1)]

Verification: No verification necessary.

AQ-68 For the purpose of determining excess NOx emissions, for each unit operating hour in which a valid hourly average is obtained, the data acquisition system and handling system must calculate and record the hourly NOx emission rate in units of ppm or lb/MMBtu, using the appropriate equation from Method 19 of 40 CFR 60 Appendix A. For any hour in which the hourly O2 concentration exceeds 19.0% O2, a diluent cap value of 19% O2 may be used in the emission calculations. [40 CFR 60.4350(b)]

Verification: No verification necessary.

AQ-69 Excess SOx emissions is each unit operating hour included in the period beginning on the date and hour of any sample for which the fuel sulfur content exceeds the applicable limits listed in this permit and ending on the date and hour that a subsequent sample is taken that demonstrates compliance with the sulfur limit. Monitoring downtime for SOx begins when a sample is not taken by its due date. A period of monitor downtime for SOx also begins on the date and hour of a required sample, if invalid results are obtained. A period of SOx monitoring downtime ends on the date and hour of the next valid sample. [40 CFR 60.4385(a) and (c)]

Verification: No verification necessary.

AQ-70 The owner or operator shall submit a written report of CEM operations for each calendar quarter to the APCO. The report is due on the 30th day following the end of the calendar quarter and shall include the following: Time intervals, data and magnitude of excess NOx emissions, nature and the cause of excess (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; Applicable time and date of each period during which the CEM was inoperative (monitor downtime), 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 and 40 CFR 60.4375(a) and 60.4395]

Verification: The project owner shall submit to the District and CPM the report of CEM operations, emission data, and monitor downtime data in the quarterly operation report (**AQ-SC8**) that follows the definitions of this condition.

AQ-71 The owner/operator shall submit to the District information correlating the NO_X control system operating parameters to the associated measured NO_X output. The information must be sufficient to allow the District to determine compliance with the NO_X emission limits of this permit during times that the CEMS is not functioning properly. [District Rule 4703]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-72 The owner/operator shall maintain the following records: date and time, duration, and type of any startup, shutdown, or malfunction; performance testing, evaluations, calibrations, checks, adjustments, any period during which a continuous monitoring system or monitoring device was inoperative, and maintenance of any continuous emission monitor. [District Rules 2201 and 4703]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-73 The owner/operator shall maintain the following records: hours of operation, fuel consumption (scf/hr and scf/rolling twelve month period), continuous emission monitor measurements, calculated ammonia slip, calculated NOx and CO mass emission rates (lb/hr and lb/twelve month rolling period), and VOC, PM10 and SOx emission rates (lb/twelve month rolling period). [District Rules 2201 and 4703]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-74 The owner/operator shall maintain a system operating log, updated on a daily basis, which includes the following information: The actual local start-up time and stop time, length and reason for reduced load periods, total hours of operation, and type and quantity of fuel used. [District Rule 4703]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-75 The owner or operator of a stationary gas turbine system shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rules 2201 and 4703]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-76 The owners and operators of each affected source and each affected unit at the source shall: (i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and (ii) have an Acid Rain permit. [40 CFR 72]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-77 The owners and operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75. [40 CFR 75]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-78 The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program. [40 CFR 75]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-79 The owners and operators of each source and each affected unit at the source shall: (i) hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)) not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and (ii) comply with the applicable Acid Rain emissions limitations for sulfur dioxide. [40 CFR 73]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-80 Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act. [40 CFR 77]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-81 An affected unit shall be subject to the sulfur dioxide requirements starting on the later of January 1, 2000, or the deadline for monitoring certification under 40 CFR part 75, an affected unit under 40 CFR 72.6(a)(3) that is not a substitution or compensating unit. [40 CFR 72, 40 CFR 75]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-82 Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program. [40 CFR 72]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-83 An allowance shall not be deducted in order to comply with the requirements under 40 CFR part 73, prior to the calendar year for which the allowance was allocated. [40 CFR 73]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-84 An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or the written exemption under 40 CFR 72.7 and 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization. [40 CFR 72]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-85 An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right. [40 CFR 72]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-86 The owners and operators of the source and each affected unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides. [40 CFR 72]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-87 The designated representative of an affected unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77. [40 CFR 77]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-88 The owners and operators of an affected unit that has excess emissions in any calendar year shall: (i) pay without demand the penalty required, and pay up on demand the interest on that penalty; and (ii) comply with the terms of an approved offset plan, as required by 40 CFR part 77. [40 CFR 77]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-89 The owners and operators of the each affected unit at the source shall keep on site the following documents for a period of five years from the date the document is created. This period may be extended for cause, at any time prior to the end of five years, in writing by the Administrator or permitting authority: (i) The certificate of representation for the designated representative for the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site beyond such five-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative. [40 CFR 72]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-90 The owners and operators of each affected unit at the source shall keep on site each of the following documents for a period of five years from the date the document is created. This period may be extended for cause, at any time prior to the end of five years, in writing by the Administrator or permitting authority; (ii) All emissions monitoring information, in accordance with 40 CFR part 75; (iii) Copies of all reports, compliance certifications and other submissions and all records made or required under the Acid Rain Program; (iv) Copies of all documents used to complete an Acid Rain permit application and any other submission that demonstrates compliance with the requirements of the Acid Rain Program. [40 CFR 72, 40 CFR 75]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-91 The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR 75 Subpart I. [40 CFR 75]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-92 Disturbances of soil related to any construction, demolition, excavation, extraction, or other earthmoving activities shall comply with the requirements for fugitive dust control in District Rule 8021 unless specifically exempted under Section 4.0 of Rule 8021 or Rule 8011. [District Rules 8011 and 8021]

Verification: A summary of significant construction activities and monitoring records required shall be included in the construction monthly compliance report (**AQ-SC3**).

AQ-93 An owner/operator shall submit a Dust Control Plan to the APCO prior to the start of any construction activity on any site that will include 10 acres or more of disturbed surface area for residential developments, or five acres or more of disturbed surface area for non-residential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. [District Rules 8011 and 8021]

Verification: The Dust Control Plan shall be included within the Air Quality Construction Mitigation Plan and submitted to the District and CPM (**AQ-SC2**), and a summary of significant construction activities and monitoring records required shall be included in the construction monthly compliance report (**AQ-SC3**).

AQ-94 An owner/operator shall prevent or cleanup any carryout or trackout in accordance with the requirements of District Rule 8041 Section 5.0, unless specifically exempted under Section 4.0 of Rule 8041 (8/19/04) or Rule 8011(8/19/04). [District Rules 8011 and 8021]

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

AQ-95 Whenever open areas are disturbed, or vehicles are used in open areas, the facility shall comply with the requirements of Section 5.0 of District Rule 8051, unless specifically exempted under Section 4.0 of Rule 8051 or Rule 8011. [District Rules 8011 and 8051] N

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

AQ-96 Any paved road or unpaved road shall comply with the requirements of District Rule 8061 unless specifically exempted under Section 4.0 of Rule 8061 or Rule 8011. [District Rules 8011 and 8061]

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

AQ-97 Water, gravel, roadmix, or chemical/organic dust stabilizers/suppressants, vegetative materials, or other District-approved control measure shall be applied to unpaved vehicle travel areas as required to limit Visible Dust Emissions to 20% opacity and comply with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011. [District Rule 8011 and 8071]

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

AQ-98 Where dusting materials are allowed to accumulate on paved surfaces, the accumulation shall be removed daily or water and/or chemical/organic dust stabilizers/suppressants shall be applied to the paved surface as required to maintain continuous compliance with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011 and limit Visible Dust Emissions (VDE) to 20% opacity. [District Rule 8011 and 8071]

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

AQ-99 On each day that 50 or more Vehicle Daily Trips or 25 or more Vehicle Daily Trips with three axles or more will occur on an unpaved vehicle/equipment traffic area, owner/operator shall apply water, gravel, roadmix, or chemical/organic dust stabilizers/suppressants, vegetative materials, or other District-approved control measure as required to limit Visible Dust Emissions to 20% opacity and comply with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011. [District Rule 8011 and 8071]

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

AQ-100 Whenever any portion of the site becomes inactive, owner/operator shall restrict access and periodically stabilize any disturbed surface to comply with the conditions for a stabilized surface as defined in Section 3.58 of District Rule 8011. [District Rules 8011 and 8071]

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

AQ-101 Records and other supporting documentation shall be maintained as required to demonstrate compliance with the requirements of the rules under Regulation VIII only for those days that a control measure was implemented. Such records shall include the type of control measure(s) used, the location and extent of coverage, and the date, amount, and frequency of application of dust suppressant, manufacturer's dust suppressant product information sheet that identifies the name of the dust suppressant and application instructions. Records shall be kept for one year following project completion that results in the termination of all dust generating activities. [District Rules 8011, 8031, and 8071]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

EQUIPMENT DESCRIPTION, UNIT N-4597-4-2

MODIFICATION OF A 471 HP CATERPILLAR MODEL 3456 DI TA AA DIESEL-FIRED EMERGENCY IC ENGINE POWERING A 300 KW ELECTRICAL GENERATOR TO REDUCE THE ANNUAL HOURS OF OPERATION FOR MAINTENANCE AND TESTING FROM 200 HOURS/YEAR TO 50 HOURS/YEAR

AQ-102 This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule]

Verification: No verification necessary.

AQ-103 Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4]

Verification: The project owner shall submit to both the District and CPM the Title V Operating Permit application prior to operation.

AQ-104 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner shall submit the results of certification tests to both the District and CPM in accordance with **AQ-111**.

AQ-105 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-106 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

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

AQ-107 The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. [District Rule 4102]

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

AQ-108 This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702 and 17 CCR 93115]

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

AQ-109 Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201, 4102, and 4801 and 17 CCR 93115]

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

AQ-110 Emissions from this IC engine shall not exceed any of the following limits: 4.69 g-NOx/bhp-hr, 0.12 g-CO/bhp-hr, or 0.04 g-VOC/bhp-hr. [District Rule 2201 and 13 CCR 2423 and 17 CCR 93115]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-111 Emissions from this IC engine shall not exceed 0.029 g-PM10/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 13 CCR 2423 and 17 CCR 93115]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-112 This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]

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

AQ-113 During periods of operation for maintenance, testing, and required regulatory purposes, the owner/operator shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or

other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]

Verification: The project owner shall submit to the District and CPM engine operation procedures and data demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-114 An emergency situation is an unscheduled electrical power outage caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the owner/operator. [District Rule 4702]

Verification: No verification necessary.

AQ-115 This engine shall not be used to produce power for the electrical distribution system, as part of a voluntary utility demand reduction program, or for an interruptible power contract. [District Rule 4702]

Verification: The project owner shall submit to the District and CPM engine operation procedures and data demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-116 This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 50 hours per calendar year. [District Rules 4702 and 17 CCR]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-117 The owner/operator shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, the purpose of the operation (for example: load testing, weekly testing, rolling blackout, general area power outage, etc.) and records of operational characteristics monitoring. For units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-118 All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

EQUIPMENT DESCRIPTION, UNIT N-4597-5-0

85 MMBTU/HR NATURAL GAS-FIRED RENTECH MODEL RTD-2-60 BOILER WITH A COEN MODEL C-RMB BURNER AND FLUE GAS RECIRCULATION OR EQUIVALENT

AQ-119 This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule]

Verification: No verification necessary.

AQ-120 Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4]

Verification: The project owner shall submit to both the District and CPM the Title V Operating Permit application prior to operation.

AQ-121 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner shall submit the results of fuel tests to both the District and CPM in accordance with **AQ-144**.

AQ-122 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-123 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

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

AQ-124 The owner/operator shall obtain written District approval for the use of any equivalent equipment not specifically approved by this Authority to Construct. Approval of the equivalent equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate equipment is equivalent to the specifically authorized equipment. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM the application for equivalent equipment as needed.

AQ-125 The owner/operator's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

Verification: The project owner shall submit to both the District and CPM the application for equivalent equipment as needed.

AQ-126 Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM the application for equivalent equipment as needed.

AQ-127 No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM the application for equivalent equipment as needed.

AQ-128 All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]

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

AQ-129 The flue gas recirculation (FGR) system shall be operated properly and shall be maintained per the manufacturer's recommendations. [District Rule 2201]

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

AQ-130 A non-resettable, totalizing mass or volumetric fuel flow meter to measure the amount of fuel combusted in the unit shall be installed, utilized and maintained. The fuel meter shall be calibrated per the fuel meter manufacturers recommendations. [District Rules 2201 and 40 CFR 60.48 (c)(g)]

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

AQ-131 The boiler shall operate a maximum of 4,000 hours per calendar year. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-132 The boiler shall only be fired on PUC-regulated natural gas with a sulfur content value not exceeding 0.66 grains of sulfur compounds (as S) per 100 dry standard cubic feet on a daily basis and 0.25 grains of sulfur compounds (as S) per 100 dry standard cubic feet on a 12-month rolling average basis. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-133 Emission rates from this unit shall not exceed any of the following limits: NOx (as NO2) – 6.0 ppmvd @ 3% O2 or 0.0073 lb/MMBtu; VOC (as methane) – 0.005 lb/MMBtu; CO - 50.0 ppmvd @ 3% O2 or 0.037 lb/MMBtu; PM10 - 0.007 lb/MMBtu; or SOx (as SO2) - 0.0019 lb/MMBtu. [District Rules 2201, 4305, 4306, 4320, and 4351]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-134 Source testing to measure NOx and CO emissions from this unit while fired on natural gas shall be conducted within 60 days of initial start-up. [District Rules 2201, 4305, 4306, and 4320]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-135 Source testing to measure NOx and CO emissions from this unit while fired on natural gas shall be conducted at least once every twelve (12) months. After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months. If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 4306, and 4320]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-136 All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 4305, 4306, and 4320]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-137 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 submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-138 The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**. The project owner shall submit source test results no later than 60 days following the source test date to both the District and CPM.

AQ-139 The source plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305, 4306, and 4320]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-140 For emissions source testing, the arithmetic average of three 30-consecutive-minute (or longer periods as necessary) test runs shall apply. If two of three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305, 4306, and 4320]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-141 NO_X emissions for source test purposes shall be determined using EPA Method 7E or ARB Method 100 on a ppmv basis, or EPA Method 19 on a heat input basis. [District Rules 4305, 4306, and 4320]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-142 CO emissions for source test purposes shall be determined using EPA Method 10 or ARB Method 100. [District Rules 4305, 4306, and 4320]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-143 Stack gas oxygen (O_2) shall be determined using EPA Method 3 or 3A or ARB Method 100. [District Rules 4305, 4306, and 4320]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-50**.

AQ-144 Testing to demonstrate compliance with the short-term (daily) fuel sulfur content limit shall be conducted monthly. If a monthly test indicates that a violation of the daily fuel sulfur content limit has occurred then weekly testing shall commence and continue until eight consecutive tests show compliance. Once compliance with the daily fuel sulfur content is demonstrated on eight consecutive weekly tests, testing may return to the monthly schedule. If the unit is not operated during an entire calendar month, fuel sulfur content testing shall not be required for that specific month. [District Rule 2201 an 40 CFR 60.4360, 60.4365(a) and 60.4370(c)]

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the District and CPM in the quarterly operation report (**AQ-SC8**).

AQ-145 Compliance with the rolling 12-month average fuel sulfur content limit shall be demonstrated monthly. The 12-month rolling average fuel sulfur content shall be calculated as follows: 12-month rolling average fuel sulfur content = Sum of the monthly average fuel sulfur contents for the previous 12 months ÷ total number of months the unit has operated in during the previous 12 months. The monthly average fuel sulfur content is the average fuel sulfur content of all tests conducted in a given month. If the unit is not operated during an entire calendar month, fuel sulfur content testing shall not be required for that specific month. Owner/operator shall keep a monthly record of the rolling 12-month average fuel sulfur content. [District Rules 1081 and 2201]

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the District and CPM in the quarterly operation report (**AQ-SC8**).

AQ-146 Fuel sulfur content shall be monitored using one of the following methods: ASTM Methods D1072, D3246, D4084, D4468, D4810, D6228, D6667 or Gas Processors Association Standard 2377. [District Rule 2201]

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the District and CPM in the quarterly operation report (**AQ-SC8**).

AQ-147 The exhaust stack shall either be equipped with a continuous emissions monitor (CEM) for NO_X, CO, and O_2 or the owner/operator shall implement one of the alternate monitoring schemes (A, B, C, D, E, F, or G) listed in District Rule 4320, Section 5.7.1 (dated 10/16/08). Owner/operator shall submit, in writing, the chosen method of monitoring (either CEMS or chosen alternate monitoring scheme) at least 30 days prior to initial operation of this boiler. [District Rules 2201, 4305, 4306 and 4320]

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

AQ-148 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 Source Emission Monitoring and Testing. [District Rule 1081]

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

AQ-149 Owner/operator shall maintain daily records of the type and quantity of fuel combusted by the boiler. [District Rule 2201 and 40 CFR 60.48 (c)(g)]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-150 Owner/operator shall keep a record of the cumulative annual quantity of hours operated for this unit. The record shall be updated at least monthly. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-151 All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, 4306, and 4320]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

EQUIPMENT DESCRIPTION, UNIT N-4597-6-0

288 BHP CUMMINS MODEL CFP83-F40 TIER 3 DIESEL-FIRED EMERGENCY IC ENGINE POWERING A FIREWATER PUMP OR EQUIVALENT

AQ-152 This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule]

Verification: No verification necessary.

AQ-153 Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4]

Verification: The project owner shall submit to both the District and CPM the Title V Operating Permit application prior to operation.

AQ-154 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner shall submit the results of certification tests to both the District and CPM in accordance with **AQ-167**.

AQ-155 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-156 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

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

AQ-157 The owner/operator shall obtain written District approval for the use of any equivalent equipment not specifically approved by this Authority to Construct. Approval of the equivalent equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate equipment is equivalent to the specifically authorized equipment. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM the application for equivalent equipment as needed.

AQ-158 The owner/operator's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

Verification: The project owner shall submit to both the District and CPM the application for equivalent equipment as needed.

AQ-159 Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM the application for equivalent equipment as needed.

AQ-160 No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM the application for equivalent equipment as needed.

AQ-161 The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. [District Rule 4102]

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

AQ-162 This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702 and 40 CFR 60.4209(a)]

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

AQ-163 This engine shall be equipped with either a positive crankcase ventilation (PCV) system that recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90% control efficiency. [District Rule 2201]

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

AQ-164 This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [40 CFR 60.4211(a)]

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

AQ-165 Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201 and 4801, 40 CFR 60.4207, and 17 CCR 93115]

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

AQ-166 Emissions from this IC engine shall not exceed any of the following limits: 2.67 g-NOx/bhp-hr, 2.39 g-CO/bhp-hr, or 0.16 g-VOC/bhp-hr. [District Rule 2201 and 13 CCR 2423 and 17 CCR 93115 and 40 CFR 60.4205(c)]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-167 Emissions from this IC engine shall not exceed 0.12 g-PM10/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 13 CCR 2423 and 17 CCR 93115 and 40 CFR 60.4205(c)]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-168 This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. For testing purposes, the engine shall only be operated the number of hours necessary to comply with the testing requirements of the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems", 1998 edition. Total hours of operation for all maintenance, testing, and required regulatory purposes shall not exceed 50 hours per calendar year. [District Rule 4702 and 17 CCR 93115 and 40 CFR 60.4211(e)]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-169 The owner/operator shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, and the purpose of the operation (for example: load testing, weekly testing, emergency firefighting, etc.). For units with automated

testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702 and 17 CCR 93115]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-170 All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702 and 17 CCR 93115]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

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AIR QUALITY APPENDIX AIR-1
GREENHOUSE GAS EMISSIONS

Testimony of Brewster Birdsall, P.E., QEP and Matthew Layton, P.E.

SUMMARY OF CONCLUSIONS

The GWF Tracy Combined Cycle Power Plant (GWF Tracy) project is a proposed addition and replacement to the state's electricity system. It would be an efficient, new, dispatchable natural gas-fired combined cycle power plant that would produce greenhouse gas (GHG) emissions while generating electricity for California consumers. It would replace the existing, less-efficient GWF Tracy Peaker Plant, and its addition to the system would displace other less efficient plants and facilitate the integration of renewable resources. Because the project's emissions per megawatt-hour (MWh) would be lower than those of other power plants that the project would displace, the addition of GWF Tracy would contribute to a reduction of the California and overall Western Electricity Coordinating Council system GHG[3] emissions and GHG emission rate average.

Staff notes that mandatory reporting of the GHG emissions provides the necessary information for the California Air Resources Board to develop greenhouse gas regulations and/or trading markets required by the California Global Warming Solutions Act of 2006 (AB 32 Núñez, Statutes of 2006, Chapter 488, Health and Safety Code sections 38500 et seq.). The project may be subject to additional reporting requirements and GHG reductions or trading requirements as these regulations are more fully developed and implemented.

On October 8, 2008, the Energy Commission adopted an order initiating an informational (OII) proceeding to solicit comments on how to assess the greenhouse gas impacts of proposed new power plants in accordance with the California Environmental Quality Act (CEQA). This analysis provides the staff's conclusions for this siting case. Future power plant siting cases are likely to be reviewed with the benefit of new information and policy direction from the Energy Commission in response to the OII. This analysis recognizes that "prudent use" of natural gas for electricity generation will serve to optimize the system (for integrating intermittent renewable generation and providing reliability), but, without further analysis and policy direction by the Commission to refine this general understanding, this analysis leaves the implications for optimizing the system to future cases (CEC 2009a).

The operation of GWF Tracy would have an impact upon the overall electricity system operation and GHG emissions in several ways:

- GWF Tracy would provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation.

3 Fuel-use closely correlates to carbon dioxide (CO_2) emissions from natural gas-fired power plants. And since CO_2 emissions from the fuel combustion dominate greenhouse gas (GHG) emissions from power plants, CO_2 and GHG are used interchangeably in this section.

- GWF Tracy would displace some less efficient local generation in the dispatch order of gas-fired facilities that are required to provide electricity reliability in the San Joaquin County and Stanislaus County areas.
- GWF Tracy would facilitate to some degree the replacement of out-of-state high-GHG emitting (e.g., coal-fired) electricity generation that must be phased out in conformance with the State's new Emissions Performance Standard.
- GWF Tracy could facilitate to some extent the replacement of generation provided by aging power plants that use once-through cooling.

The ability of, and the magnitude to which, GWF Tracy fulfills these roles are uncertain given that the project would be permitted to operate as a base load facility with an overall annual capacity factor of up to 98% (GWF 2008a), and no other conditions would specify the power plant's obligations and roles within the system. While the energy displaced by the GWF Tracy project would result in a reduction in GHG emissions from the electricity system, the project's role in optimizing the system and its potential GHG benefits are less than ideal for two reasons: 1) its proposed technology would not provide fast-starting capabilities under all conditions, and 2) its proposed location would not be physically within a major local reliability area like the Greater Bay Area. Still, the project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, staff believes that the project would result in a net reduction in GHG emissions from power plants, would not worsen, but would improve, current conditions, and would, thus, not result in impacts that are cumulatively significant.

Staff concludes that the short-term emission of greenhouse gases during construction would be sufficiently reduced by "best practices" and would not be significant.

The project could comply with the limits of the Greenhouse Gas Emission Performance Standard (Title 20, California Code of Regulations, section 2900 et seq., pursuant to SB 1368) that applies to utility purchases of base load power from power plants.

INTRODUCTION

Greenhouse gas (GHG) emissions are not criteria pollutants, but they are discussed in the context of cumulative impacts. The state has demonstrated its intent to address global climate change though research, adaptation,[4] and inventory reductions. In that context, staff evaluates the GHG emissions from the proposed project, presents information on GHG emissions related to electricity generation, and describes the applicable GHG standards and requirements.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws and policies in **Greenhouse Gas Table 1** pertain to the control and mitigation of greenhouse gas emissions. Staff's analysis examines the project's compliance with these requirements.

4 While working to understand and reverse global climate change, it is prudent to also adapt to potential changes in the state's climate (for example, changing rainfall patterns).

Greenhouse Gas Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
State	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)	California Global Warming Solutions Act of 2006. This act requires the California Air Resources Board (ARB) to enact standards that will reduce GHG emissions to 1990 levels. Electricity production facilities will be regulated by the ARB.
California Code of Regulations, tit. 17, Subchapter 10, Article 2, sections 95100 et. seq.	ARB regulations implementing mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)
Title 20, California Code of Regulations, section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009	The regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 $MTCO_2$/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lb CO_2/MWh)

GLOBAL CLIMATE CHANGE AND CALIFORNIA

There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions of greenhouse gases, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Indeed, the California Legislature finds that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Health & Safety Code, sec. 38500).

In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including a need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p. 5). In 2003, the Energy Commission recommended that the state require reporting of greenhouse gases or global climate change[5] emissions as a condition of state licensing of new electric generating facilities (CEC 2003, IEPR p. 42). In 2006, California enacted the California Global Warming Solutions Act of 2006 (AB 32). It requires the California Air Resources Board (ARB) to adopt standards that will reduce statewide GHG emissions to statewide GHG emissions levels in 1990, with such reductions to be

5 Global climate change is the result of greenhouse gases, or emissions with global warming potentials, affecting the energy balance and, thereby, climate of the planet. The term greenhouse gases (GHG) and global climate change (GCC) gases are used interchangeably.

achieved by 2020[6] To achieve this, ARB has a mandate to define the 1990 emissions levels and achieve the maximum technologically feasible and cost-effective GHG emission reductions.

The ARB adopted early action GHG reduction measures in October 2007, adopted mandatory reporting requirements and the 2020 statewide target in December 2007, and adopted a statewide scoping plan in December 2008 to identify how emission reductions will be achieved from significant sources of GHG via regulations, market mechanisms, and other actions. ARB staff is developing regulatory language to implement its plan and holds ongoing public workshops on key elements of the recommended GHG reduction measures, including market mechanisms (ARB 2006). The regulations must be effective by January 1, 2011, and mandatory compliance commences on January 1, 2012. The mandatory reporting requirements are effective for electric generating facilities over 1 megawatt (MW) capacity, and the due date for initial reports by existing facilities this first year was June 1, 2009.

Examples of strategies that the state might pursue for managing GHG emissions in California, in addition to those recommended by the Energy Commission and the Public Utilities Commission, were identified in the California Climate Action Team's Report to the Governor (CalEPA 2006). The scoping plan approved by the ARB in December 2008 builds upon the overall climate policies of the Climate Action Team report and shows the recommended strategies to achieve the goals for 2020 and beyond. Some strategies focus on reducing consumption of petroleum across all areas of the California economy. Improvements in transportation energy efficiency (fuel economy) and land use planning and alternatives to petroleum-based fuels are slated to provide substantial reductions by 2020 (CalEPA 2006). The scoping plan includes a 33% Renewables Portfolio Standard (RPS), aggressive energy efficiency targets, and a cap-and-trade system that includes the electricity sector (ARB 2008c).

It is possible that GHG reductions mandated by ARB will be non-uniform or disproportional across emitting sectors, in that most reductions will be based on cost-effectiveness (i.e., the greatest effect for the least cost). For example, the ARB proposes a 40% reduction in GHG from the electricity sector, even though the sector currently only produces about 25% of the state's GHG emissions. In response, in September 2008 the Energy Commission and the California Public Utilities Commission provided recommendations (CPUC 2008) to ARB on how to achieve such reductions through both programmatic and regulatory approaches and identified points of regulation within the sector should ARB decide that a multi-sector cap and trade system is warranted.

The Energy Commission's *2007 Integrated Energy Policy Report* (IEPR) also addresses climate change within the electricity, natural gas, and transportation sectors (CEC 2007a). For the electricity sector, it recommends such approaches as pursuing all cost-effective energy efficiency measures and meeting the Governor's stated goal of a 33% Renewables Portfolio Standard.

6 Governor Schwarzenegger has also issued Executive Order S-3-05 establishing a goal of 80% below 1990 levels by 2050.

SB 1368,[7] enacted in 2006, and regulations adopted by the Energy Commission and the Public Utilities Commission pursuant to the bill, prohibits California utilities from entering into long-term commitments with any base load facilities that exceed the Greenhouse Gas Emission Performance Standard of 0.500 metric tonnes CO_2 per megawatt-hour[8] (1,100 pounds CO_2/MWh). Specifically, the SB 1368 Emission Performance Standard (EPS) applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or more, including contracts with power plants located outside of California[9] If a project, instate or out of state, plans to sell base load electricity to California utilities, the utilities will have to demonstrate that the project complies with the EPS. *Base load* units are defined as units that operate at a capacity factor higher than 60%. As a project applying for the flexibility to operate in base load scenarios, GWF Tracy would have to meet the SB 1368 EPS.

In addition to these programs, California is involved in the Western Climate Initiative, a multi-state and international effort to establish a cap and trade market to reduce greenhouse gas emissions in the western United States and the Western Electricity Coordinating Council (WECC). The timelines for the implementation of this program are similar to those of AB 32, with full roll-out beginning in 2012. As with AB 32, the electricity sector has been a major focus of attention.

ELECTRICITY PROJECT GREENHOUSE GAS EMISSIONS

Electricity use can be as simple as turning on a switch to operate a light or fan. The system to deliver the adequate and reliable electricity supply is complex and variable. But it operates as an integrated whole to meet demand, such that the dispatch of a new source of generation unavoidably curtails or displaces one or more less efficient or less competitive existing sources. Within the system, generation resources provide electricity, or energy, generating capacity, and ancillary services to stabilize the system and facilitate electricity delivery, or movement, over the grid. *Capacity* is the instantaneous output of a resource, in megawatts. *Energy* is the capacity output over a unit of time, for example an hour or year, generally reported as megawatt-hours or gigawatt-hours (GWh). Ancillary services[10] include regulation, spinning reserve, non-spinning reserve, voltage support, and black start capability. Individual generation resources can be built and operated to provide only one specific service. Alternatively, a resource may be able to provide one or all of these services, depending on its design and constantly changing system needs and operations.

California is actively pursuing policies to reduce GHG emissions that include adding non-GHG emitting renewable generation resources to the system mix. In this context, and because fossil-fueled resources produce GHG emissions, it is important to consider the role and necessity of also adding fossil-fuel resources. In a report prepared as a

7 Public Utilities Code § 8340 et seq.
8 The Emission Performance Standard only applies to carbon dioxide and does not include emissions of other greenhouse gases converted to carbon dioxide equivalent.
9 See Rule at http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm
10 See page CEC 2009b, page 95.

response to the GHG OII (CEC 2009a), five roles that gas-fired power plants are likely to fulfill in a high-renewables, low-GHG system are defined (CEC 2009b, pp 93 and 94):

1. Intermittent generation support
2. Local capacity requirements
3. Grid operations support
4. Extreme load and system emergency
5. General energy support.

The Energy Commission staff-sponsored report reasonably assumes that non-renewable power plants added to the system would almost exclusively be natural gas-fueled. Nuclear, geothermal, and biomass plants are generally base load and not dispatchable. Solid fueled projects are also generally base load, not dispatchable and carbon sequestration technologies needed to reduce the GHG emission rates to meet the EPS are not yet developed (CEC 2009b, p. 92). Further, California has almost no sites available to add highly dispatchable hydroelectric generation.

Generation of electricity using any fossil fuel, including natural gas, can produce greenhouse gases with the criteria air pollutants that have been traditionally regulated under the federal and state Clean Air Acts. For fossil fuel-fired power plants, the GHG emissions include primarily carbon dioxide, with much smaller amounts of nitrous oxide (N_2O, not NO or NO_2, which are commonly known as NOx or oxides of nitrogen), and methane (CH_4 – often from unburned natural gas). Also included are sulfur hexafluoride (SF_6) from high voltage equipment and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. GHG emissions from the electricity sector are dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG emissions are small and also are more likely to be easily controlled or reused or recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials. Global warming potential is a relative measure, compared to carbon dioxide, of a compound's residence time in the atmosphere and ability to warm the planet. Mass emissions of GHGs are converted into carbon dioxide equivalent (CO2E) metric tonnes (MT) for ease of comparison.

PROJECT CONSTRUCTION

Construction of industrial facilities such as power plants requires coordination of a variety of equipment and personnel. The concentrated on-site activities result in short-term, unavoidable increases in vehicle and equipment emissions that include greenhouse gases. Construction of GWF Tracy would involve 20 months of activity. GWF provided a GHG emission estimate for the entirety of the construction phase (CH2M2008f). The GHG emissions estimate, presented below in **Greenhouse Gas Table 2**, includes the total emissions for the 20 months of construction activity in terms of CO_2-equivalent.

Greenhouse Gas Table 2
GWF Tracy, Estimated Potential Construction Greenhouse Gas Emissions

Construction Source	Construction-Phase GHG Emissions (MTCO2E) [a]
On-Site Construction Equipment	3,153
On-Site Worker Vehicles	5.5
Off-Site Worker Commute	603
Construction Total	**3,760**

Source: CH2M2008f
Notes:
a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms

PROJECT OPERATIONS

GWF Tracy would reconfigure the existing pair of combustion turbine generators (CTG) at the Tracy Peaker Plant as a new combined cycle power plant, in which electricity is generated by the two CTGs and a new steam turbine generator (STG) operating on heat recovered from the gas turbines' exhaust. The project would include duct-fired heat recovery steam generators (HRSG) and an air cooled condenser to cool steam after its use in the steam turbine (GWF 2008a). The two-train CTG/HRSG configuration also allows for high efficiency during unit turndown because one CTG can operate at a more efficient full load while the other is shut down, rather than operating two CTGs at an inefficient 50% load. The project would be equipped with an auxiliary boiler to maintain the temperature of the HRSG and STG and reduce warm and hot startup times. The duration of cold startups can take up to three hours. The auxiliary boiler provides GWF Tracy with the ability to complete warm and hot startups[11] in less than two hours (GWF 2008a).

The proposed GWF Tracy project would be permitted to operate up to 98% capacity annually at full load operation. The primary sources of GHG would be the natural gas fired combustion turbines. There would also be a small amount of GHG emissions from the auxiliary boiler, the new diesel-fueled fire water pump engine, the existing emergency generator engine, and sulfur hexafluoride emissions from new electrical component equipment. The employee and delivery traffic GHG emissions from off-site activities are negligible in comparison with the gas turbine and boiler GHG emissions.

Greenhouse Gas Table 3 shows what the proposed project, as permitted, could potentially emit in greenhouse gases on an annual basis. All emissions are converted to CO_2-equivalent and totaled. Electricity generation GHG emissions are generally

11 A *cold startup* of the STG/HRSG system is typically defined as startup of the combined cycle system following a shutdown of the steam turbine lasting at least 48 to 72 hours. During a cold startup of the steam turbine system, the CTG/HRSG system is brought on line at low load to gradually increase the temperature of the STG and prevent thermal metal fatigue. A *warm startup* system is defined as a startup of the combined cycle system following a shutdown of the steam turbine lasting at least eight hours and less than 48 to 72 hours. A *hot startup* is defined as a startup of the combined cycle system following a shutdown of the steam turbine lasting less than eight hours.

dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG are typically small and also are more likely to be easily controlled or reused/recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials. A small amount of additional SF_6 containing equipment will be required for this project, and the leakage of SF_6 and its CO_2 equivalent emissions have been estimated.

Greenhouse Gas Table 3
GWF Tracy, Estimated Potential Greenhouse Gas (GHG) Emissions

Emissions Source	**Operational GHG Emissions (MTCO2E/yr)** [a]
Turbine/HRSG/STG	1,110,229
Auxiliary Boiler	18,093
Emergency Fire Pump	7
Existing Emergency Generator	11
Worker Commutes – Off-Site	143
Material Deliveries – Off-Site	20
Total Project GHG Emissions, excluding Off-Site Emissions (MTCO2E/yr)	**1,128,369**
Estimated Annual Energy Output (MWh/yr) [b]	2,371,772
Estimated Annualized GHG Performance (MTCO2/MWh)	**0.474**
Estimated Annualized GHG Performance (MTCO2E/MWh)	**0.476**

Sources: AFC Table 5.1-11 (GWF2008a); Response to DR3 (CH2M2008f) including methane (CH_4) and nitrous oxide (N_2O); independent Energy Commission staff analysis for estimated energy output.
Notes:
a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
b. Annualized basis is 3,100 hours with duct burning at 314 MW and 5,539 hours at 253 MW without duct burning.

The proposed project would be permitted, on an annual basis, to emit over 1,100,000 metric tonnes of CO_2-equivalent per year if operated at its maximum permitted level. The new GWF Tracy combined cycle plant would be more efficient than the Tracy Peaker Plant that it would replace, which has a GHG performance of about 0.652 MTCO2/MWh. The GWF Tracy project, at 0.474 MTCO2/MWh, could easily meet the limits of SB 1368 and the Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh.

The proposed project would increase the available energy and capacity to the electricity system currently provided by the existing Tracy Peaker Plant. The San Joaquin County (Stockton) and Stanislaus County areas would likely benefit from the incremental increase in energy and capacity provided by GWF Tracy, but the project would not be physically located in a major local reliability area that has, or is projected to have, capacity shortfalls. A project located in a major load pocket, for example, the Greater Bay Area Local Capacity Area, would be more likely to provide local reliability support and facilitate the retirement of other power plants to a degree that the GWF Tracy project could not.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Staff assesses the cumulative effects of GHG emissions caused by both construction and operation. As the name implies, construction impacts result from the emissions occurring during the construction of the project. The operation impacts result from the emissions of the proposed project during operation. Staff is continuing to monitor development of AB 32 Scoping Plan implementation efforts and general trends and developments affecting GHG regulation in the electricity sector.

The impact of GHG emissions caused by this natural gas-fired facility is characterized by considering how the power plant would impact the overall electricity system. The integrated electricity system depends on generation resources to provide energy and satisfy local capacity needs. As directed by the OII (CEC 2009a), staff is refining and implementing the concept of a "blueprint" that describes the long-term role of fossil-fueled power plants in California's electricity system. The five separate roles that gas-fired power plants are most likely to fulfill in the future of a high-renewables, low-GHG system include: 1) Intermittent generation support; 2) Local capacity requirements; 3) Grid operations support; 4) Extreme load and system emergencies support; and 5) General energy support (CEC 2009b, p. 93). GWF Tracy is analyzed here for its role in providing local capacity and generation and general energy support for expected generation retirements or replacements.

CONSTRUCTION IMPACTS

Staff does not believe that the minor GHG emission increases from construction activities would be significant for several reasons. First, the period of construction would be short-term and the emissions intermittent during that period, not ongoing during the life of the project. Additionally, control measures that staff recommends to address criteria pollutant emissions, such as limiting idling times and requiring, as appropriate, using equipment that meet the latest criteria pollutant emissions standards would further minimize greenhouse gas emissions to the extent feasible. The use of newer equipment will increase fuel efficiency and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment.

DIRECT/INDIRECT OPERATION IMPACTS AND MITIGATION

New, efficient, natural gas-fired generation promotes the state's efforts to improve overall system efficiencies and, therefore, reduce the amount of natural gas used by electricity generation and greenhouse gas emissions. As the *2007 Integrated Energy Policy Report* (CEC 2007a, p. 184) noted:

> New natural gas-fueled electricity generation technologies offer efficiency, environmental, and other benefits to California, specifically by reducing the amount of natural gas used—and with less natural gas burned, fewer greenhouse gas emissions. Older combustion and steam turbines use outdated technology that makes them less fuel- and cost-efficient than newer, cleaner plants.…The 2003 and 2005 IEPRs noted that the state could help reduce natural gas consumption for electric generation by taking steps to retire older, less efficient natural gas power plants and replace or repower them with new, more efficient power plants.

Thus, in the context of the Energy Commission's *Integrated Energy Policy Report*, the GWF Tracy project furthers the state's strategy to promote generation system efficiency and reduce fossil fuel use and GHG emissions. As stated in the 2009 *Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California* (CEC 2009b, p.20):

> When one resource is added to the system, all else being held equal, another resource will generate less power. If the new resource has a lower cost or fewer emissions than the existing resource mix, the aggregate system characteristics will change to reflect the cheaper power and lower GHG emissions rate.

Net GHG emissions for the integrated electric system will decline when new gas-fired power plants are added to: 1) permit the penetration of renewable generation to the 33% target; 2) improve the overall efficiency of the electric system; or 3) serve load growth or capacity needs more efficiently than the existing fleet (CEC 2009b, p. 98). GWF Tracy, with its lower heat rate than the existing Tracy Peaker Plant that it would replace and most other dispatchable gas-fired generation in the state, would be more efficient and lower GHG-emitting than the existing fleet.

The Role of GWF Tracy in Local Generation Displacement

The proposed GWF Tracy project would have a net heat rate between 7,800 and 8,700 Btu/kWh[12] and an estimated base load annual GHG performance factor of 0.474 MTCO2/MWh. The local generation resources and heat rates of other local units are listed in **Greenhouse Gas Table 4**. Compared to most other new and existing units in San Joaquin County and Stanislaus County, including the existing Tracy Peaker Plant, GWF Tracy would be more efficient, and emit fewer GHG emissions during any hour of operation. Local generating units with the best, or lowest heat rate or lowest GHG performance factor, generally operate more than other units with higher heat rates, as shown by the relative amount of energy (GWh) produced in 2008 from the local units. However, dispatch order can change, or deviate from economic or efficiency dispatch, in any one year or due to other concerns such as permit limits, contractual obligations, droughts, heat waves, local reliability needs or emergencies. These deviations, however, are likely to occur infrequently.

12 Based on the High Heating Value (HHV) of the fuel(s) used. HHV is used for all heat rate and fuel conversions to GHG mass emissions that are discussed in this document.

Greenhouse Gas Table 4
San Joaquin and Stanislaus Counties, Local Generation
Heat Rates and 2008 Energy Outputs

Plant Name	Heat Rate (Btu/kWh) [a]	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Walnut Energy Center	7,822	1,578	0.415
Woodland 1	8,761	416	0.465
Lodi CC (NCPA STIG)	9,000	72	0.477
Almond Power Plant	11,074	62	0.587
MID Ripon	11,908	33	0.631
McClure 1, 2	15,222	18	0.807
Walnut (Peaker)	19,098	1	1.013
Existing Tracy Peaker Plant	12,310	11	0.652
Proposed GWF Tracy (at permitted limit)	8,056	2,372 (max est.)	0.474

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER); with independent Energy Commission staff analysis for GWF Tracy on annualized basis of 3,100 hours with duct burning at 314 MW and 5,539 hours at 253 MW, not including duct burning.
Notes:
a. Based on the Higher Heating Value or HHV of the fuel.

While GWF Tracy is close to the Greater Bay Area Local Capacity Area, it is not physically located in the area and may not be able to provide capacity during some system operating conditions.

The Role of GWF Tracy in the Integration of Renewable Energy

As California moves towards an increased reliance on renewable energy, the bulk of renewable generation available to, and used in California, will be intermittent wind generation with some intermittent solar (CEC 2009b, p.3). To accommodate the increased variability in generation due to increasing renewable penetration, compounded by increasing load variability, control authorities such as the California Independent System Operator (CAISO) need increased flexibility from other generation resources such as hydro generation, dispatchable pump loads, energy storage systems, and fast ramping and fast starting fossil fuel generation resources (CAISO 2007, p. 14).

GWF Tracy would provide flexible, dispatchable and fast ramping[13] power that would not obstruct penetration of renewable energy. In general, combined cycle combustion

13 The CAISO categorizes *fast-ramping* as a generator capable of going from lowest power to highest in under 20 minutes, or greater than 10 MW per minute.

turbines can ramp up quickly, but the combined cycle facility overall output is limited to about 15 MW per minute[14] by the steam turbine and HRSG.

GWF Tracy would not, however, provide fast starting[15] capabilities when the HRSG and steam turbine are cold. Intermittent renewable sources of energy would be accommodated by GWF Tracy varying its energy output as needed to integrate the renewable sources, but the lack of fast-start capabilities under all conditions make it likely that GWF Tracy may not be able to play a role in some system operating scenarios.

The amount of dispatchable fossil fuel generation will have to be significantly increased to meet the 20% RPS (CAISO 2007, p.113); the 33% RPS will require even more dispatchable resources to integrate the renewables. However, this does not suggest the existing and new fossil fuel capacity will operate more. **Greenhouse Gas Table 5** shows how the build-out of either the 20% or the 33% RPS will affect generation from new and existing non-renewable resources. Should California reach its goal of meeting 33% of its retail demand in 2020 with renewable energy, non-renewable, most likely fossil-fueled, energy needs will fall by over 36,000 GWh/year. In other words, all growth will need to come from renewable resources to achieve the 33% RPS. And some existing and new fossil units will generate less energy than they currently do, given the expected growth in retail sales.

These assumptions are conservative in that the forecasted growth in retail sales assumes that the impacts of planned increases in expenditures on (uncommitted) energy efficiency are already embodied in the current retail sales forecast.[16] If, for example, forecasted retail sales in 2020 should be lowered by 10,000 GWh due to the success of increased energy efficiency expenditures, non-renewable energy needs fall by an additional 6,700 to 8,000 GWh/year, depending on whether 20% or 33% RPS is assumed.

The Role of GWF Tracy in Retirements/Replacements

GWF Tracy would provide more than 2,300 GWh of natural gas-fired generation to replace resources that are or will likely be precluded from serving California loads. State policies, including GHG goals, are discouraging or prohibiting new contracts and new investments in high GHG-emitting resources such as coal-fired generation, generation that relies on water for once-through cooling, and aging power plants (CEC 2007a). Some of the existing plants that are likely to require significant capital investments to continue operation in light of these policies may be unlikely to undertake the investments and will retire or be replaced.

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14 Of the 2,821 MW of thermal resources providing Ancillary Services to the CAISO, most (2,441 MW) have ramp rates between 10 and 31 MW/min. The bulk of the resources providing Ancillary Services with ramp rates greater than 10 MW/min (7,141 MW) are hydroelectric facilities (ISO 2007).
15 In general, fast starts are defined as being less than two hours.
16 The extent to which uncommitted energy efficiency savings are already represented in the current Energy Commission demand forecast is a subject of study for the 2009 IEPR.

Greenhouse Gas Table 5
Estimated Changes in Non-Renewable Energy
Potentially Needed to Meet California Loads, 2008-2020

California Electricity Supply	**Annual GWh**	
Statewide Retail Sales, 2008, estimated [a]	265,185	
Statewide Retail Sales, 2020, forecast [a]	308,070	
Growth in Retail Sales, 2008-20	42,885	
Growth in Net Energy for Load [b]	46,316	
California Renewable Electricity	**GWh @ 20% RPS**	**GWh @ 33% RPS**
Renewable Energy Requirements, 2020 [c]	61,614	101,663
Current Renewable Energy, 2008	29,174	
Change in Renewable Energy-2008 to 2020 [c]	32,440	72,489
Resulting Change in Non-Renewable Energy [d]	13,876	(-36,173)

Source: Energy Commission staff 2009.
Notes:
a. Not including 8% transmission and distribution losses.
b. Based on 8% transmission and distribution losses, or 42,885 GWh x 0.08 = 46,316 GWh.
c. Renewable standards are calculated on retail sales and not on total generation, which accounts for 8% transmission and distribution losses.
d. Based on net energy (including 8% transmission and distribution losses), not based on retail sales.

Replacement of High GHG-Emitting Generation

High-GHG emitting, such as coal-fired resources, are effectively prohibited from entering into new contracts for California deliveries as a result of the Emissions Performance Standard adopted in 2007 pursuant to SB 1368. Between now and 2020, more than 18,000 GWh of energy procured by California utilities under existing contracts will have to be replaced; these contracts are listed in **Greenhouse Gas Table 6**.

This represents almost half of the energy associated with California utility contracts with coal-fired resources that will expire by 2030. If the State enacts a carbon adder[17], all the coal contracts (including those in **Greenhouse Gas Table 6**, which expire by 2020 and, other contracts that expire beyond 2020 and are not shown in the table) may be retired at an accelerated rate as coal-fired energy becomes uncompetitive due to the carbon adder or the capital needed to capture and sequester the carbon emissions. Also shown are the approximate 500 MW of in-state coal and petroleum coke-fired capacity that may not be able to contract with California utilities due to the SB 1368 Emission Performance Standard. As these contracts expire, new and existing generation resources will replace the lost energy and capacity. Some will come from renewable generation; some will come from new and existing natural gas fired generation. New generation resources generally will emit significantly less GHG than the coal and

17 A carbon adder or carbon tax is a specific value added to the cost of a project per ton of associated carbon or carbon dioxide emissions. Because it is based on, but not limited to, actual operations and emission and can be trued up at year end, it is considered a simple mechanism to assign environmental costs to a project.

petroleum coke-fired generation, which average about 1.0 MTCO2/MWh, or more than two times more than new natural gas-fired combined-cycle projects like GWF Tracy, resulting in a significant net reduction in GHG emissions from the California electricity sector.

Greenhouse Gas Table 6
Expiring Long-term Contracts with Coal-fired Generation 2009 – 2020

Utility	Facility [a]	Contract Expiration	Annual GWh Delivered to CA
PG&E, SCE	Misc In-state Qual.Facilities [a]	2009-2019	4,086
LADWP	Intermountain	2009-2013	3,163 [b]
City of Riverside	Bonanza, Hunter	2010	385
Department of Water Resources	Reid Gardner	2013 [c]	1,211
SDG&E	Boardman	2013	555
SCE	Four Corners	2016	4,920
Turlock Irrigation District	Boardman	2018	370
LADWP	Navajo	2019	3,832
		TOTAL	**18,522**

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings.
Notes:
a. All facilities are located out-of-state except for the Miscellaneous In-state Qualifying Facilities.
b. Estimated annual reduction in energy provided to LADWP by Utah utilities from their entitlement by 2013.
c. Contract not subject to Emissions Performance Standard, but the Department of Water Resources has stated its intention not to renew or extend.

Retirement of Generation Using Once-Through Cooling

New, dispatchable resources like GWF Tracy would also be required to provide generation capacity (that is, the ability to meet fluctuating, intermittent electricity loads) in the likely event that facilities utilizing once-through cooling (OTC) are retired. The State Water Resource Control Board (SWRCB) has proposed significant changes to OTC units, which would likely require retrofit, retirement, or significant curtailment of dozens of generating units. In 2008, these units collectively produced about 58,000 GWh. While those OTC facilities owned and operated by utilities and recently-built combined-cycle plants may well install dry or wet cooling towers, it is unlikely that the aging, merchant plants will do so. Most of these units operate at low capacity factors, suggesting a limited ability to compete in the current electricity market. Although the timing would be uncertain, new resources would out-compete aging plants and would likely displace the energy provided by OTC facilities and accelerate the retirements.

Any additional costs associated with complying with the SWRCB regulation would be amortized over a limited revenue stream today and into the foreseeable future. Their energy and much of their dispatchable, load-following capability will have to be replaced. These units constitute over 15,000 MW of merchant capacity and 17,800 GWh of merchant energy. Of this, much but not all of the capacity and energy are in

local reliability areas, requiring a large share of replacement capacity – absent transmission upgrades – to locations in the same local reliability area. **Greenhouse Gas Table 7** provides a summary of the utility and merchant energy supplies affected by the OTC regulations.

Greenhouse Gas Table 7
Aging Units and Units Utilizing Once-Through Cooling:
Capacity and 2008 Energy Output [a]

Plant, Unit Name	Owner	Local Reliability Area	Aging Plant?	Capacity (MW)	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Diablo Canyon 1, 2	Utility	None	No	2,232	17,091	Nuclear
San Onofre 2, 3	Utility	L.A. Basin	No	2,246	15,392	Nuclear
Broadway 3 [b]	Utility	L.A. Basin	Yes	75	90	0.648
El Centro 3, 4 [b]	Utility	None	Yes	132	238	0.814
Grayson 3-5 [b]	Utility	LADWP	Yes	108	150	0.799
Grayson CC [b]	Utility	LADWP	Yes	130	27	0.896
Harbor CC	Utility	LADWP	No	227	203	0.509
Haynes 1, 2, 5, 6	Utility	LADWP	Yes	1,046	1,529	0.578
Haynes CC [c]	Utility	LADWP	No	560	3,423	0.376
Humboldt Bay 1, 2 [a]	Utility	Humboldt	Yes	107	507	0.683
Olive 1, 2 [b]	Utility	LADWP	Yes	110	11	1.008
Scattergood 1-3	Utility	LADWP	Yes	803	1,327	0.618
Utility-Owned				**7,776**	**39,988**	**0.693**
Alamitos 1 - 6	Merchant	L.A. Basin	Yes	1,970	2,533	0.661
Contra Costa 6, 7	Merchant	S.F. Bay Area	Yes	680	160	0.615
Coolwater 1-4 [b]	Merchant	None	Yes	727	576	0.633
El Segundo 3, 4	Merchant	L.A. Basin	Yes	670	508	0.576
Encina 1-5	Merchant	San Diego	Yes	951	997	0.674
Etiwanda 3, 4 [b]	Merchant	L.A. Basin	Yes	666	848	0.631
Huntington Beach 1, 2	Merchant	L.A. Basin	Yes	430	916	0.591
Huntington Beach 3, 4	Merchant	L.A. Basin	No	450	620	0.563
Mandalay 1, 2	Merchant	Ventura	Yes	436	597	0.528
Morro Bay 3, 4	Merchant	None	Yes	600	83	0.524
Moss Landing 6, 7	Merchant	None	Yes	1,404	1,375	0.661

Plant, Unit Name	Owner	Local Reliability Area	Aging Plant?	Capacity (MW)	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Moss Landing 1, 2	Merchant	None	No	1,080	5,791	0.378
Ormond Beach 1, 2	Merchant	Ventura	Yes	1,612	783	0.573
Pittsburg 5-7	Merchant	S.F.Bay	Yes	1,332	180	0.673
Potrero 3	Merchant	S.F.Bay	Yes	207	530	0.587
Redondo Beach 5-8	Merchant	L.A. Basin	Yes	1,343	317	0.810
South Bay 1-4	Merchant	San Diego	Yes	696	1,015	0.611
Merchant-Owned				**15,254**	**17,828**	**0.605**
Total In-State OTC				**23,030**	**57,817**	

Source; Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings
Notes:
a. OTC Humboldt Bay Units 1 and 2 are included in this list. They must retire in 2010 when the new Humboldt Bay Generating Station (not ocean-cooled), currently under construction, enters commercial operation.
b. Units are aging but are not OTC.
c. The Los Angeles Department of Water and Power (LADWP) reported a 2007 aggregate energy number of 4,003 GWh for all the Haynes units. Staff allocated the energy between the units based on Haynes' current and historical output allocations in the LADWP fillings for 2009 IEPR.

New generation resources that can either provide local support or energy will emit significantly less GHGs than aging and/or OTC plants whose generation they could partially displace. Existing aging and OTC natural gas generation averages 0.6 to 0.7 MTCO2/MWh, or less than two times more than new natural gas-fired combined-cycle projects like GWF Tracy. When a new project can provide energy and capacity to displace the existing generation, it can provide a significant net reduction in GHG emissions from the California electricity sector. A project located in a load pocket, for example, the Greater Bay Area Local Capacity Area, would more likely provide local reliability support as well as facilitate the retirement of aging and/or OTC power plants to a degree that the GWF Tracy project could not.

CUMULATIVE IMPACTS

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or . . . compound or increase other environmental impacts" (CEQA Guidelines § 15355). "A cumulative impact consists of an impact that is created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts" (CEQA Guidelines § 15130[a][1]). Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely related past, present, and reasonably foreseeable future projects.

This entire assessment is a cumulative impact assessment. The project would emit greenhouse gases and, therefore, has been analyzed as a potential cumulative impact in the context of its effect on the electricity system, resulting GHG emissions from the system, and existing GHG regulatory requirements and GHG energy policies.

COMPLIANCE WITH LORS

Ultimately, ARB's AB 32 regulations are likely to address both the degree of electricity generation sector emissions reductions (through cap-and-trade), and the method by which those reductions will be achieved (e.g., through command-and-control). However, the exact approach to be taken is currently under development. That regulatory approach may address emissions not only from the newer, more efficient, and lower emitting facilities licensed by the Energy Commission, but also from the older, higher-emitting facilities not subject to any GHG reduction standard that this agency could presently impose. This programmatic approach is likely to be more effective in reducing GHG emissions overall from the electricity sector than one that merely relies on displacing out-of-state coal plants ("leakage") or older "dirtier" facilities.

The Energy Commission and the Public Utilities Commission provided recommendations (CPUC 2008) to ARB on how to achieve such reductions through both programmatic and regulatory approaches and identified the regulation points should ARB decide that a multi-sector cap-and-trade system is warranted. As ARB codifies accurate GHG inventories and methods, it may become apparent that emission reductions from the generation sector are less cost-effective than other sectors, and that other sectors of sources can achieve reductions with relative ease and cost-effectiveness.

The project would be subject to ARB's mandatory reporting requirements and potentially other future requirements mandating compliance with AB 32 that are being developed by ARB. How the project would comply with these ARB requirements is speculative at this time, but compliance would be mandatory. The ARB's mandatory GHG emissions reporting requirements do not indicate whether the project, as defined, would comply with the potential GHG emissions reduction regulations being formulated under AB 32. The project may have to provide additional reports and GHG reductions, depending on the future regulations expected from ARB.

Reporting of GHG emissions would enable the project to demonstrate consistency with the policies described above and the regulations that ARB adopts and to provide the information to demonstrate compliance with any applicable EPS that could be enacted in the next few years. The GWF Tracy project could meet the current Emission Performance Standard in SB 1368.

NOTEWORTHY PUBLIC BENEFITS

Electricity is produced by operation of inter-connected generation resources and, by knowing the fuel used by the generation sector, the resulting GHG emissions can be known. The operation of GWF Tracy would have an impact upon the overall electricity system operation and GHG emissions in several ways:

- GWF Tracy would provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation.

- GWF Tracy would displace some less efficient local generation in the dispatch order of gas-fired facilities that are required to provide electricity reliability in the San Joaquin County and Stanislaus County areas.
- GWF Tracy would facilitate to some degree the replacement of out-of-state high-GHG emitting (e.g., coal-fired) electricity generation that must be phased out in conformance with the State's new Emissions Performance Standard.
- GWF Tracy could facilitate to some extent the replacement of generation provided by aging power plants that use once-through cooling.

The project would likely lead to a net reduction in GHG emissions across the electricity system providing energy and capacity to California. Thus, staff believes that the project would result in a cumulative overall reduction in GHG emissions from the state's power plants, would not worsen current conditions, and would thus not result in impacts that are cumulatively significant. Moreover, it would be consistent with AB 32 goals.

The energy displaced by the GWF Tracy project would result in a reduction in GHG emissions from the electricity system. In other system roles, as described in **Greenhouse Gas Table 8**, the ability to minimize its GHG impacts by filling the expected future roles for gas-fired generation, in a high-renewables, low-GHG system, is not well defined for the GWF Tracy project due to its proposed technology and location.

Greenhouse Gas Table 8
GWF Tracy, Summary of Role in Providing Energy and Capacity Resources

Services Provided by Generating Resources	Discussion, GWF Tracy
Integration of Renewable Energy	• *Would not* provide fast startup capability (within two hours), except during warm and hot start conditions. • Would provide rapid ramping capability. • Would have ability to provide regulation and reserves, and energy when renewable resources are unavailable.
Local Generation Displacement	• *Would not* be able to satisfy/partially satisfy local capacity area (LCA) resource requirements. • Would provide voltage support. • *Would not* provide black start capability.
Ancillary Services, Grid System, and Emergency Support	• *Would not* provide fast start-up capability (within two hours) , except during warm and hot start conditions. • *Would not* have low minimum load levels. • Would provide rapid ramping capability. • Would have ability to provide regulation and reserves. • *Would not* provide black start capability.
General Energy Support	• Would provide general energy support. • Could facilitate some retirements and replacements • Would provide cost-competitive energy. • Would be able to help a load-serving entity (LSE) meet resource adequacy (RA) requirements.

Source: Energy Commission staff; based on: Expected Roles for Gas-Fired Generation (CEC 2009b, p. 7).

CONCLUSIONS

GWF Tracy would be an efficient, new, dispatchable natural gas-fired combined cycle power plant that would cause GHG emissions while generating electricity for California consumers. AB 32 emphasizes that GHG emission reductions must be “big picture” reductions that do not lead to “leakage” of such reductions to other states or countries. The project’s GHG emissions per MWh would be lower than the existing Tracy Peaker Plant that the project would replace, and the project’s GHG emissions are expected to be lower than those of other power plants and peaking projects that the project would displace and, thus, would contribute to continued improvement of the California and overall Western Electricity Coordinating Council system’s GHG emissions and GHG emission rate average.

The project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, staff believes that the project would result in a cumulative overall reduction in GHG emissions from the state’s power plants, would not worsen current conditions, and would thus not result in impacts that are cumulatively significant. Other potential GHG benefits gained by the project’s role in optimizing the system are less defined for GWF Tracy with its proposed technology and in its location outside of a major local reliability area.

Staff notes that mandatory reporting of GHG emissions per Air Resources Board greenhouse gas regulations would occur, and this would enable the ARB to gather the information needed to regulate GWF Tracy in trading markets if required by the regulations implementing the California Global Warming Solutions Act of 2006 (AB 32). The project may be subject to additional reporting requirements and GHG reduction or trading requirements as these regulations are more fully developed and implemented.

Staff does not believe that the minor GHG emission increases from construction activities would be significant for several reasons. First, the period of construction would be short-term and the emissions intermittent during that period, not ongoing during the life of the project. Additionally, control measures, or best practices, that staff recommends for minimizing criteria pollutants, such as limiting idling times and requiring, as appropriate, equipment that meets the latest emissions standards, would further minimize greenhouse gas emissions since staff believes that the use of newer equipment would increase fuel efficiency and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment. For all these reasons, staff concludes that the short-term emission of greenhouse gases during construction would be substantially reduced and would, therefore, not be significant.

The GWF Tracy project could meet Emission Performance Standard of SB 1368.

PROPOSED CONDITIONS OF CERTIFICATION

None proposed. The project owner would comply with mandatory ARB GHG emissions reporting regulations (California Code of Regulations, tit. 17, section 95100 et. seq.) and/or future GHG regulations formulated by the ARB, such as limits set by GHG emissions cap and trade markets.

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BIOLOGICAL RESOURCES

Testimony of Anne Wallace

SUMMARY OF CONCLUSIONS

GWF Energy LLC (GWF or applicant) proposes to modify the existing Tracy Peaker Plant (TPP) from a nominal 169-MW simple-cycle power plant to a combined-cycle power plant, increasing the generating capacity by 145 MW to 314 MW net. The new power plant would be named GWF Tracy Combined Cycle Power Plant (GWF Tracy) and would occupy 16.38 acres of a fenced site within an existing GWF-owned 40-acre parcel in an unincorporated portion of San Joaquin County immediately southwest of Tracy. The project would include three main elements: 1) construction of the new power plant, 2) reconductoring two segments of existing transmission line, and 3) operation of the plant.

Energy Commission staff (staff) has analyzed the potential impacts to biological resources that would result from construction and operation of the proposed power plant. All of the construction-related impacts for GWF Tracy would occur on the same 34.6 acres that were impacted during construction of the TPP. Habitat at the plant site is currently ruderal upland and of low quality for native plants and wildlife. Temporary and permanent impacts to habitats (i.e., temporary and permanent habitat loss) on those 34.6 acres were mitigated for construction of the TPP project through the San Joaquin Council of Governments (SJCOG) under the *San Joaquin County Multi-species Habitat Conservation and Open Space Plan* (SJCOG 2000), also referred to below as the SJMSCP. Mitigation was accomplished through payment of a fee to SJCOG to satisfy conditions requiring habitat compensation. Impacts to those same 34.6 acres for construction of GWF Tracy would not require additional mitigation for temporary and permanent habitat loss.

Other impacts to special-status species associated with GWF Tracy, beyond temporary and permanent habitat loss, include but are not limited to potential loss of dens and nesting habitat in laydown and parking areas, disturbance to breeding or nesting animals in habitats adjacent to laydown and parking areas, and disturbance impacts of construction and operation noise and night lighting. Through informal consultation, USFWS and CDFG agreed to defer to SJCOG for all formal consultation for the GWF Tracy project (A. Wallace 2009a, 2009b). The SJCOG would require no further consultation for these impacts provided that the applicant implements all the incidental take minimization and mitigation measures required for mitigation of TPP impacts (SJCOG 2002).

Energy Commission jurisdiction on siting projects includes all project elements up to and including the first point of interconnection with the existing electrical grid. For GWF Tracy, the first point of interconnection would be the Lammers Substation, and all *construction-related* impacts up to that point would be under Energy Commission jurisdiction. The *reconductoring* elements of the project would take place beyond Lammers Substation and would be completed by PG&E; therefore, reconductoring would not be under Energy Commission jurisdiction. However, staff recommends that reconductoring activities be conducted outside of the nesting and breeding season.

Additionally, staff recommends the presence of a qualified biological monitor during all reconductoring activities adjacent to the impoundment at the north end of Segment 3.

Habitats along reconductoring segments are mostly developed and degraded; however, one reconductoring segment crosses two high-quality riparian zones. Potential impacts associated with reconductoring would be permitted by PG&E under the *Pacific Gas and Electric San Joaquin Valley Operation and Maintenance Habitat Conservation Plan (PG&E 2007),* also referred to below as the PG&E HCP. To satisfy requirements of the California Environmental Quality Act (CEQA), staff discusses potential project-related impacts of reconductoring in this assessment and makes recommendations to minimize impacts but, because it is outside of Energy Commission permitting authority, does not propose conditions of certification.

INTRODUCTION

This section provides the staff analysis of potential impacts to biological resources from the proposed GWF Tracy project. The purpose of this analysis is to determine whether there would be impacts to state- and federally listed species, species of special concern, or species otherwise protected by statute, and to wetlands, surface waters, or other sensitive habitats or features. This analysis presents information regarding the affected biotic community, the potential environmental impacts associated with construction and operation of the proposed project, and where necessary specifies mitigation planning and compensation measures to reduce potential impacts to less-than-significant levels.

This analysis is based, in part, on information provided in the GWF Tracy application for certification (AFC) for the project (GWF 2008a); technical assistance and consultations with CDFG, USFWS, and SJCOG; a site visit on February 27, 2009; and responses to Workshop Informal Data Request Set 1 dated January 23, 2009 (CH2M 2009c).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

During project construction and operation, GWF Tracy would need to comply with the laws, ordinances, regulations, and standards (LORS) presented in **Biological Resources Table 1** below.

Biological Resources Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Endangered Species Act (Title 16, United States Code, sections 1531 et seq.; Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for the protection of threatened and endangered plant and animal species and their critical habitat. The administering agency is USFWS.
Fish and Wildlife Coordination Act (Title 16, United States Code, section 661)	Requires all federal agencies to coordinate with the USFWS in the preservation of fish and wildlife implementing federal actions.
Bald Eagle Protection Act (Title 16, United States Code 668)	Specifically protects bald and golden eagles from harm or trade in parts. Includes golden eagles because immatures of both species look similar for several years.
Migratory Bird Treaty Act (Title 16, United States Code, sections 703–711)	Prohibits the take or possession of any migratory nongame bird (or any part of such migratory nongame bird), including nests with viable eggs. As defined, includes nearly every nongame bird in the state. The administering agency is USFWS.
State	
California Endangered Species Act (Fish and Game Code, sections 2050 et seq.)	Protects California's rare, threatened, and endangered species. The administering agency is CDFG.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals that are classified as rare, threatened, or endangered in California. The administering agency is CDFG.
California Public Resources Code (Title 14, sections 670.2 and 670.5)	Lists the plants and animals of California that are declared rare, threatened, or endangered. Administering agency is CDFG.
California Species Preservation Act of 1970 (California Fish and Game Code 900-903)	Requires the protection and enhancement of birds, mammals, fishes, amphibians, and reptiles of California. Administering agency is CDFG.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Designates certain bird, mammal, reptile, amphibian, and fish species as fully protected, and prohibits take of such species. The administering agency is CDFG.
Native Plant Protection Act (Fish and Game Code, section 1900 et seq.)	Designates rare, threatened, and endangered plants in California and prohibits the taking of listed plants. The administering agency is CDFG.

Applicable Law	Description
Nest or Eggs (Fish and Game Code, section 3503)	Prohibits take, possession, or needless destruction of the nest or eggs of any bird. The administering agency is CDFG.
Birds of Prey (Fish and Game Code section 3503.5)	Specifically protects California's birds of prey in the orders Falconiformes and Strigiformes by making it unlawful to take, possess, or destroy any such birds or to take, possess, or destroy the nests or eggs of any such bird. The administering agency is CDFG.
Migratory Birds (Fish and Game Code, section 3513)	Prohibits take or possession of any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird. The administering agency is CDFG.
Local	
San Joaquin County Multi-species Habitat Conservation and Open Space Plan	Provides a strategy for balancing the need to conserve open space and the need to convert open space to developed uses while protecting the region's agricultural economy; preserving landowner property rights; providing for the long-term management of plant, fish, and wildlife species, especially those that are currently listed or may be listed in the future, under federal or state ESAs; providing and maintaining multiple-use open spaces that contribute to the quality of life of the residents of San Joaquin County; and accommodating a growing population while minimizing costs to project proponents and society at large (SJCOG 2000).
San Joaquin County General Plan 2010 – Vegetation, Fish, and Wildlife Habitat	Intended to protect and improve the county's vegetation, fish, and wildlife resources, and provide undeveloped open space for nature study, protection of endangered species, and preservation of wildlife habitat. Resources of significant biological and ecological importance shall be protected, including wetlands; riparian areas; rare, threatened, and endangered species and their habitats as well as potentially rare or commercially important species; vernal pools; and significant oak groves and heritage trees.

SETTING

REGIONAL SETTING

The city of Tracy is located in the San Joaquin Valley portion of the California Central Valley in southwest San Joaquin County. The Central Valley dominates the central portion of California, stretching 400 miles from Redding to Bakersfield, and is the most productive agricultural area in California. The Central Valley currently supports approximately 6.5 million people and is the fastest-growing region in California. The San Joaquin Valley is bounded by the Sacramento-San Joaquin Delta to the north, the Sierra Nevada range to the east, the Tehachapi Mountains to the south, and the Coast Ranges and San Francisco Bay to the west. The San Joaquin Valley historically contained many natural habitats supporting a variety of plants and animals. Currently, the valley's natural habitats have been fragmented by agricultural and urban

development, leading to habitat loss, reduction in population numbers to the point of federal and state listing, and in some cases extinction and extirpation of species.

PROJECT SITE AND VICINITY DESCRIPTION

GWF Tracy would be located on a 40-acre parcel in an unincorporated portion of southwest San Joaquin County, south of West Schulte Road. The project area is bordered by the Delta-Mendota Canal on the southwest, agricultural property on the south and east, and the Union Pacific Railroad, a glass manufacturing plant, and a biomass power plant on the north. The site is accessed by a paved service road south of West Schulte Road that was created as part of the original TPP project. The proposed 15.58-acre construction and laydown/parking area is a previously disturbed portion of the 40-acre parcel outside of the currently fenced TPP; it is currently open, ruderal grassland. GWF Tracy would be located within the area previously used for the TPP temporary staging and parking during its construction. The two segments of transmission line that would require reconductoring are both located within agricultural areas and occur along existing county roads or major highways. All ground disturbance for reconductoring would be limited to temporary staging areas and pull sites, using previously disturbed areas along each segment wherever possible.

Existing Vegetation, Wildlife, and Habitats

Biological surveys were conducted by the applicant in 2001 for the TPP, and reconnaissance surveys were conducted in 2007 and 2008 for GWF Tracy (GWF 2008a, p. 5.2-8). A reconnaissance-level survey was conducted on the 40-acre parcel in 2007 and on three[1] reconductoring segments in 2008 (GWF 2008a, p. 5.2-8). A list of species observed during those surveys is provided in the AFC (GWF 2008a, tables 5.2-2 and 5.2-3). Habitats within one mile of the GWF Tracy project area and reconductoring segments were assessed for potential to support special-status plants and animals, and habitats within 10 miles were assessed for potential to support nesting Swainson's hawks.

Many of the proposed GWF Tracy project features would be located within the existing fenced TPP site, which comprises structures, paved roads, a stormwater basin, and gravel-topped open spaces. Within the fenced area, there is no bare soil or landscaping. The remainder of the 40-acre parcel is characterized by ruderal nonnative grasses on leveled former agricultural land that lacks surface hydrology, seasonal ponding, and native vegetation (GWF 2008a, p. 5.1-15). The parcel has been disturbed by current and past industrial and agricultural development and, aside from the nonnative grasslands, is currently maintained with ornamental plantings, cultivation, and weed control. Many of the ornamental or visual-screening plantings of cottonwoods (*Populus fremontii*), redbud (*Cercis occidentalis*), and elderberry (*Sambucus mexicanus*) planted following TPP construction were in declining condition during the April 2007 survey, with less than 10 of the plantings in stable or thriving condition. The failed trees have since been replaced and are now being irrigated. During 2008 surveys, the new plantings were observed to be thriving (GWF 2008a, p. 5.2-13).

[1] Three segments were initially proposed in the AFC for reconductoring and all three were included in the preliminary staff assessment; however, the current project would require reconductoring on only two of those segments. This is discussed in more detail below.

Existing habitats, including the developed TPP site, support reptile, bird, and mammal species common to the San Joaquin Valley including these observed species (GWF 2008a, p. 5.2-13): western fence lizard (*Sceloporus occidentalis*), red-tailed hawk (*Buteo jamaicensis*), rock dove (*Columba livia*), black phoebe (*Sayornis nigricans*), western kingbird (*Tyrannus verticalis*), European starling (*Sturnus vulgaris*), western meadowlark (*Sturnella neglecta*), black-tailed hare (*Lepus californicus*), house mouse (*Mus musculus*), and coyote (*Canis latrans*). The GWF Tracy site, while providing no vegetation, would support roosting and perching for local passerines and raptors and there is evidence that California ground squirrels (*Spermophilus beecheyi*) and cottontails (*Sylvilagus audubonii*) enter the area under the security fence. In April 2008, a great horned owl (*Bubo virginianus*) nested on piping of one of the peaking units at the site and appeared not to be disturbed by the unit's operation (GWF 2008a, p. 5.2-13).

The reconductoring segments that are part of the current project (segments 2 and 3) occur either within agricultural developments or adjacent to existing roads (GWF 2008a, p. 5.2-7). These areas are dominated by nonnative grasses and forbs or are planted with ornamental trees. Wildlife using these areas would be similar to what is described above. Segment 3 crosses two high-quality riparian corridors: Paradise Cut and Tom Paine Slough, both of which are sensitive habitats and important for special-status species (see **Biological Resources Table 2** below).

Special-status Species

Biological Resources Table 2 below lists the special-status species being considered in this staff assessment. A 2009 records search of the California Natural Diversity Database (CNDDB) for the nine-quad area centered on the project area returned occurrence records for a number of special-status plant and wildlife species (CDFG 2009). Of those, 19 are being considered for project-related impacts in this staff assessment. Reasons for their inclusion in **Biological Resources Table 2** are provided in the table, and species that were excluded from further consideration are discussed below the table. In this staff assessment, special-status species are defined as plant and animal species that are state or federally listed or proposed for listing; state fully protected; candidates for state or federal listing; state species of special concern, and California Native Plant Society (CNPS) List 1B or List 2 plants.

Biological Resources Table 2
Special-status Species Potentially Occurring
In or Near the GWF Tracy Project Area

Common Name	Scientific Name	Status*
Plants		
Suisun marsh aster	*Aster lentus*	HCP/List 1B.2
Big tarplant	*Blepharizonia plumosa*	List 1B.1
Round-leaved filaree	*California macrophylla*	List 1B.1
Lemmon's jewelflower	*Caulanthus coulteri* var. *lemmonii*	List 1B.2
Slough thistle	*Cirsium crassicaule*	HCP/List 1B.1
Delta button-celery	*Eryngium racemosum*	SE/1B.1
Mason's lilaeopsis	*Lilaeopsis masonii*	HCP/List 1B.1
Wright's trichocoronis	*Trichocoronis wrightii* var. *wrightii*	List 2.1
Caper-fruited tropidocarpum	*Tropidocarpum capparideum*	List 1B.1
Invertebrates		
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FE/HCP
Reptiles		
San Joaquin whipsnake	*Masticophis flagellum ruddocki*	CSC
Birds		
Tricolored blackbird	*Agelaius tricolor*	CSC/HCP
Burrowing owl	*Athene cunicularia*	CSC/HCP
Swainson's hawk	*Buteo swainsoni*	ST/HCP
Northern harrier	*Circus cyaneus*	CSC
White-tailed kite	*Elanus leucurus*	FP
Loggerhead shrike	*Lanius ludovicianus*	CSC/HCP
Mammals		
American badger	*Taxidea taxus*	CSC
San Joaquin kit fox	*Vulpes macrotis mutica*	FE/CT/HCP

* FE = federally endangered; FT = federally threatened; FC = federal candidate for listing; SE = state endangered; ST = state threatened; SCL = state candidate for listing; CSC = California species of special concern; FP=fully protected under Fish and Game Code, i.e., no take is allowed; HCP = San Joaquin multi-species conservation plan; California Native Plant Society List 1B = rare, threatened, or endangered in California and elsewhere; List 2 = rare, threatened, or endangered in California but more common elsewhere (GWF 2001a, 2008a; CDFG 2009; CNPS 2008).

Special-status Species Excluded from Further Consideration

The following species were excluded from consideration in the impact assessment.

There are no vernal pools in or near the project area, so vernal pool branchiopods, California tiger salamanders (*Ambystoma californiense*), and western spadefoots (*Spea hammondii*) were excluded from further consideration. The project area is outside the range of both the Alameda whipsnake (*Masticophis lateralis euryxanthus*) and the curve-footed hygrotus diving beetle (*Hygrotus curvipes*). The Sacramento anthicid beetle (*Anthicus sacramento*) is restricted to sand dunes, which do not occur in the project area.

The silvery legless lizard (*Anniella pulchra*) requires open areas with sparse vegetation and moist soils, conditions not found in the project area. Similarly, the coast horned lizard (*Phrynosoma coronatum frontale*) prefers sandy soils in areas of sparse vegetation and is therefore not likely to occur. The foothill yellow-leg frog (*Rana boylii*) requires rocky streams with flowing, highly oxygenated water; such streams do not occur in the project area. Although the California red-legged frog (*Rana draytonii*) is known to travel in straight-line routes between suitable aquatic sites and could therefore potentially occur in many otherwise-unsuitable locations, the distance to suitable aquatic habitats makes their potential for occurrence on the GWF Tracy site remote. The same is true for the western pond turtle (*Actinemys marmorata*). There is no suitable giant garter snake (*Thamnophis gigas*) habitat near the project site and they were not considered in this assessment.

Ferruginous hawks (*Buteo regalis*) and merlins (*Falco columbarius*) are winter visitors and do not nest in Central California – they could avoid foraging near disturbing activities. Golden eagles (*Aquila chrysaetos*) were eliminated because there is no suitable nesting habitat nearby. The California horned lark (*Eremophila alpestris actia*) prefers habitats that are less vegetated than the project site and less disturbed than the reconductoring sites.

There are no potentially affected marshes or riparian zones likely to support yellow-headed blackbirds (*Xanthocephalus xanthocephalus*), western yellow-billed cuckoos (*Coccyzus americanus occidentalis*), yellow-breasted chats (*Icteria virens*), riparian brush rabbits (*Sylvilagus bachmani riparius*), and riparian woodrats (*Neotoma fuscipes riparia*).

The San Joaquin pocket mouse (*Perognathus inornatus*) occurs in sandy soils at the base of shrubs in open grassland and scrub areas with little disturbance, conditions not found at the site. The Townsend's big-eared bat (*Corynorhinus townsendii*) prefers more mesic sites and is extremely sensitive to human disturbance; it is not likely to roost or forage near the project site. The two bat species most likely to occur in the Tracy area, the pallid bat (*Antrozous pallidus*) and the western mastiff bat (*Eumops perotis*), are known to roost in Corral Hollow but are not likely to roost in or near the project site.

Special-status Plants

A 2009 CNDDB search of the nine-quad area centered on the project area returned occurrence records for nine special-status plants known to occur within five miles of

project and reconductoring sites (GWF 2008a, figures 5.2-5 and 5.2-6). They are included in **Biological Resources Table 2** above. Of these nine, five are known to occur within a one-mile radius of the project site (CDFG 2009). They include caper-fruited tropidocarpum, big tarplant, Suisun Marsh aster, Delta button-celery, and Wright's trichocoronis[2].

The special-status plants of the lower San Joaquin Valley are largely associated with alkaline soils of scrub, grassland, playa, or seasonal wetland habitats (GWF 2008a, p. 5.2-14). Large-scale conversion of these natural habitats to agricultural use has eliminated habitats capable of supporting special-status plants at and near the project site and focused surveys in 2001 and 2007 were negative (GWF 2008a, p. 5.2-14 to 15). Reconductoring sites have not been surveyed for special-status plants, but reconductoring pull sites all occur in highly altered landscapes where special-status plants would be unlikely to occur (CH2M 2009c).

Special-status Wildlife - Aquatic

There are no aquatic habitats in the project area that could potentially support special-status wildlife. The Delta-Mendota Canal flows directly adjacent to the project site but is not considered wildlife habitat.

Special-status Wildlife – Terrestrial

The terrestrial habitats of project impact areas could support burrowing owls and San Joaquin kit foxes. Both are known to use disturbed areas. Both could either regularly or periodically den, nest, forage, winter, or disperse through the area. Both could occupy dens in the ruderal grasslands on site, including reconductoring areas, or they could potentially use dens along the margins of agricultural fields and farm roads, in berms or banks around irrigation or drainage ditches, under cement-lined ditches, in the railroad berm, or along the Delta-Mendota Canal. They could also den or take cover in the pipes extending from the landscape berm at the TPP site or in culverts under the road.

The CNDDB contains records for burrowing owls and San Joaquin kit foxes within one mile of the GWF Tracy and reconductoring sites (CDFG 2009).

The San Joaquin whipsnake could potentially occupy the ruderal fields on site; the white-tailed kite could nest in nearby trees and forage over the site; the American badger is likely to den in the vicinity and could potentially den or forage on site; the loggerhead shrike could nest in the landscape trees of the TPP and around reconductoring sites and forage over the project area; and northern harriers could nest in fields on or near the site and forage over the site.

Northern harrier, Swainson's hawk, and loggerhead shrike were observed on or near the project site during 2007 and 2008 surveys (GWF 2008a, p. 5.2-11).

2 Note that scientific names are provided in text only for those species not included in **Biological Resources Table 2**.

Migratory Birds and Raptors

As defined by the Migratory Bird Treaty Act (MBTA), migratory birds include essentially all native, nongame bird species in California, whether they migrate or not. Exceptions are game birds such as grouse, quail, and ducks, and nonnative species like rock dove, European starling, and ring-necked pheasant (*Phasianus colchicus*). The MBTA protects breeding adults and nests, eggs, and young of these birds. All bird nests, including those not covered by the MBTA, are also protected by California Fish and Game Code.

The open ruderal fields of the project area, including recent tree plantings associated with TPP visual screening, provide tree- and ground-nesting opportunities for a variety of medium to small birds. Transmission towers and trees in the area could support nesting raptors as well as ravens (*Corvus corax*) and crows (*Corvus brachyrhynchos*), which are all protected by the MBTA. Elements of the new GWF Tracy plant would provide additional perches for raptors and other birds. Birds of otherwise open country take advantage of human-made structures to rest and to hunt. As mentioned above, a great horned owl nest was discovered on piping of one of the peaking units at the TPP in 2008. After consultation with the Energy Commission biological staff and other agencies, the affected peaking unit was started for scheduled maintenance and the owls were apparently not disturbed by the unit's operation. The adult and juvenile owls continued to be present at the site. Although plant-related perches could be used by local birds, they would not be expected to be an attractant, i.e., they would not be expected to increase either bird density or bird diversity over existing conditions.

Water Resources, Wetlands, and Waters of the US

There is no natural hydrology on the GWF property. Drainage on site is captured in the existing TPP stormwater system, which percolates into the groundwater (GWF 2008a, p. 5.2-29). This existing stormwater collection system would be used for the GWF Tracy project and would be modified as necessary to accommodate the plant layout. The collection system and basin are free of vegetation and are not expected to be inundated long enough to provide aquatic habitat for animals or to attract waterfowl or shorebirds (GWF Tracy 2008a, p. 5.2-29).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Significant impacts to biological resources would occur if special-status species or species otherwise protected by state and federal statute are likely to be impacted by construction or operation of the proposed project. A proposed project would have a significant impact to biological resources if it would:

- Interrupt migration,
- Reduce native fish, wildlife, and plant habitat,
- Cause a fish or wildlife population to drop below self-sustaining levels, or
- Disturb or degrade wetlands, marshes, riparian areas, or other wildlife habitat.

Harassment of a protected species that caused adverse behavioral changes would also be considered significant; harassment is considered “take” under state and federal endangered species acts.

DIRECT AND INDIRECT IMPACTS AND MITIGATION

Direct impacts are a result of construction or operation of the project and occur at the same time and place as project activities. Direct impacts of GWF Tracy could include direct loss of habitat, mortality of animals occupying burrows when ground is broken, or disturbance that causes nest abandonment. Indirect impacts are caused by the project, but occur later in time or are farther removed in distance. The primary indirect impact of GWF Tracy would be the potential for avian collision with the exhaust stacks and other tall structures of the proposed project.

This section analyzes the potential for direct and indirect impacts of construction and operation of the proposed project to biological resources and suggests impact avoidance, minimization, and mitigation measures to reduce the severity of potentially adverse impacts. Applicant-proposed impact avoidance, minimization, and mitigation measures were incorporated into the project description in the AFC and are considered part of the proposed project. These measures may be separate from and in addition to staff’s proposed conditions of certification outlined below. Staff’s proposed conditions of certification are intended to supersede applicant-proposed measures where they are different.

Construction Impacts and Mitigation

The proposed project consists of various components related to converting the existing simple-cycle TPP into a combined-cycle power plant with a 314-MW net increase in generating capacity. Most components would be constructed or demolished within the existing security fence for the TPP. Project components outside the existing security fence include a new permanent stormwater retention basin and two new permanent transmission structures, as well as an area for temporary laydown and parking and an area for construction parking and trailers.

- **Power Plant Site.** GWF Tracy would permanently occupy a 16.38-acre fenced site within an existing GWF-owned 40-acre parcel. Included in this acreage would be 3.28 acres of new permanent disturbance for a relocated stormwater retention basin, and two new 45-foot-tall tubular steel transmission structures that would be placed in an existing PG&E right-of-way to facilitate electric interconnection. Some existing TPP components would be demolished. Among the new features that would be constructed are two 150-foot-tall, 17-foot diameter exhaust stacks to replace the existing 100-foot stacks; a 50-foot auxiliary boiler stack (48 inches diameter); and an air-cooled condenser that would be 114 feet tall, 234 feet long, and 215 feet wide. Construction would take place over a period of approximately 22 months.
- **Laydown and Parking Areas.** A total of 12.3 acres of the 40-acre parcel would be used for temporary laydown and parking areas. Laydown and parking would be outside the currently fenced TPP site and would be restored to preproject conditions at the end of construction.

No construction of offsite linears would be required. The existing plant is serviced by a PG&E natural-gas pipeline that connects to the TPP. The existing pipeline would be tapped at the existing site to provide the additional natural gas necessary. GWF Tracy would require an increase in annual water consumption of approximately 24.9 acre-feet. Water would be provided through the existing water pipeline developed for TPP. Electric interconnection is described below under **RECONDUCTORING IMPACTS**.

Construction Impacts to General Vegetation

Construction impacts to vegetation could occur in a variety of ways, including the direct removal of plants during construction. As these impacts are generally localized and are primarily temporary, they are not usually considered significant unless the habitat type is regionally unique or is known to support special-status species. The GWF Tracy site is characterized by developed areas surrounded by ruderal uplands or otherwise disturbed habitats including the Delta-Mendota Canal and agriculture. Regionally unique habitat or habitat capable of supporting special-status plants is not present at the site. Construction activities, including equipment laydown and parking, would require the removal of ruderal upland vegetation. Significant impacts to native vegetation would not be expected and no mitigation is proposed.

Construction Impacts to General Wildlife

Direct loss of small mammals, reptiles, and other less-mobile species could occur during construction of the proposed project. This would result primarily from the use of construction vehicles, which could collapse underground burrows or drive over animals. Construction activities and increased human presence could disrupt breeding or foraging activities of some common wildlife species for the duration of construction.

The project site provides marginally suitable nesting habitat for some common bird species. Western meadowlarks (*Sturnella neglecta*) could nest in the ruderal uplands on the 40-acre parcel; house finches (*Carpodacus mexicanus*) could nest in some of the larger ornamental trees around the existing TPP site; house sparrows (*Passer domesticus*) could potentially nest in stationary equipment once construction begins; and killdeer (*Charadrius vociferus*) often nest in gravel parking lots and other bare areas if they are somewhat remote from disturbance. Small animals such as house mice, deer mice (*Peromyscus maniculatus*), cottontail, lizards, and snakes have also been known to nest or shelter in stored equipment. Wildlife and nests within the staging area would be at risk when equipment is moved. Construction activities during the nesting season (March through August) could adversely affect breeding birds through direct take or through disruption or harassment. Construction could discourage wildlife from using the area for foraging or dispersal during the day, but crepuscular and nocturnal wildlife could continue to use the site or nearby areas outside of working hours. The high level of construction activity is expected, however, to discourage most wildlife from taking shelter or residence in the construction area.

The applicant has proposed impact avoidance and minimization measures for biological resources as follows (GWF 2008a):

- Apply all the impact avoidance and minimization measures that were implemented for TPP (p. 5.2-6) – these are incorporated by reference (see GWF 2001a);

- Conduct preconstruction surveys within two weeks prior to ground-breaking or vegetation clearing (p. 5.2-30);
- Clear vegetation outside the breeding season, if possible (p. 5.2-28);
- Incorporate noise monitoring and mitigation if nesting birds are detected on site (5.2-30);
- Grade areas that require grading prior to March 1 and inspect them routinely for nesting activity (p. 5.2-28);
- Flag any nests found in or adjacent to disturbance areas and protect the area immediately around them from construction equipment, then monitor these nests and present results in monthly compliance reports to the Energy Commission (p. 5.2-28); and
- Restore temporary disturbance areas to preproject conditions (p. 5.2-7 and 5.2-22).

Staff agrees with these applicant-proposed measures and has incorporated them into the conditions of certification below. Staff's proposed conditions of certification provide additional detail as well as adjustments to certain dates and timing. Specifically, the burrowing owl breeding season, which includes nest construction (SJCOG 2000), is considered to start February 1. Moreover, San Joaquin kit fox pups can be born as early as mid to late February and other raptors may also start nest construction in early to mid February. Staff proposes in Condition of Certification **BIO-7** that all grading and site clearing be completed between September 1 and January 31, if possible, as it would be preferable to discourage breeding in the project area than to need to mitigate impacts to breeding individuals and risk disturbance and potential loss of young.

Construction Impacts to Special-status Species

Plants

Project construction takes place entirely within developed areas or in degraded, ruderal uplands that are unlikely to support special-status plants. No special-status plants were found during focused surveys at the project site in 2001 and 2007 (GWF 2008a, p. 5.2-15). No impacts to special-status plants are expected and no mitigation is proposed.

Wildlife

When the TPP was constructed, 34.6 acres of the 40-acre parcel were temporarily or permanently disturbed. Consultation and permitting for temporary and permanent impacts to habitats for San Joaquin kit foxes, burrowing owls, and other special-status species were accomplished under the *San Joaquin County Multi-species Habitat Conservation and Open Space Plan* (SJMSCP) through the San Joaquin Council of Governments (GWF 2008a, § 5.2.2.3.1). GWF Energy purchased habitat mitigation credits totaling $58,474 for those 34.6 acres. Because the GWF Tracy project would take place on the same 34.6 acres that were mitigated previously, no further mitigation for habitat compensation would be required for the new plant site; however, implementation of incidental take minimization measures would be required under the SJMSCP. Incidental take minimization measures were developed for the TPP project (SJCOG 2002) and the same measures would need to be implemented for the GWF

Tracy project (Mayo pers. comm.). Reconductoring takes place outside of the 34.6 acres and would be mitigated separately; this is discussed further under **RECONDUCTORING IMPACTS** below.

Even though temporary and permanent habitat loss within the 34.6 acres have already been mitigated, much of the project area could still support denning and burrowing animals such as kit foxes, American badgers, and burrowing owls. These three species use or enlarge burrows, or dens, created by California ground squirrels, and all three could potentially den on the 40-acre parcel. Dens in areas proposed for development or laydown would be destroyed. Animals occupying those dens, both within and adjacent to impacted areas, could be disturbed or harmed. Northern harriers and loggerhead shrikes could potentially nest within the 40-acre parcel and construction-related activities during the nesting season could disrupt nesting or otherwise adversely affect reproductive success. Staff's proposed conditions of certification **BIO-6** through **BIO-10** outline a number of impact avoidance and minimization measures for all of these species, including measures specific to protection of kit foxes and burrowing owls, which would also be protective of American badgers. Specifically, **BIO-8** would require preconstruction surveys, which would detect the presence of nesting birds and of dens that could potentially support fossorial animals both within and adjacent to the 40-acre parcel, while **BIO-9** and **BIO-10** describe what the applicant would do to protect individual animals that might be found occupying those dens, and **BIO-6** (preparation and implementation of a mitigation and monitoring plan) and **BIO-7** (impact avoidance measures) describe how nesting birds would be protected.

The undeveloped portions of the 40-acre parcel could also support foraging special-status wildlife including kit foxes, burrowing owls, badgers, San Joaquin whipsnakes, Swainson's hawks, northern harriers, white-tailed kites, and loggerhead shrikes. Approximately 3.28 acres of foraging habitat would be permanently replaced by development. Another 12.3 acres would be temporarily disturbed. The 12.3 acres would become less available for foraging, especially during daytime hours, for the duration of construction, but they would be restored to preproject conditions at the end of construction. These impacts to foraging habitat are part of the 34.6 acres of mitigation for the TPP and would not need to be further mitigated.

Applicant-proposed impact avoidance and minimization measures along with staff's proposed conditions of certification **BIO-1** through **BIO-10** would prevent impacts or mitigate them to less-than-significant levels. Conditions of certification **BIO-6** through **BIO-10** are described above. Conditions of certification **BIO-1** through **BIO-4** would require the presence of a Designated Biologist or biological monitors to ensure the safety of general and special-status wildlife. Condition of Certification **BIO-5** would make workers aware of sensitive wildlife and how to protect them through a worker environmental awareness program.

Staff has determined in consultation with USFWS and CDFG that final guidance regarding impact avoidance, minimization, and mitigation measures would be provided solely by the SJCOG through the San Joaquin Multi-species Conservation Plan (SJCOG 2000). Both agencies would defer to SJCOG for final guidance and would not review and comment on the project directly. The SJCOG would require no further

consultation for these impacts provided that the applicant implements all the incidental take minimization and mitigation measures required for mitigation of TPP impacts (SJCOG 2002).

Construction Noise and Vibration

Birds communicate primarily through vocalizations and auditory cues. Increased noise levels can interfere with normal communication, potentially interfering with maintenance of contact between mated birds, obscuring warning and distress calls that signify predators and other threats, and affecting feeding behavior and protection of the young. High noise levels may also render an otherwise suitable nesting area unsuitable. Animals rely on hearing to avoid predators, obtain food, and communicate. Long-term exposure to noise can cause excessive stimulation to the nervous system and chronic stress that is harmful to health and reproductive fitness (Fletcher 1980, 1990). Behavioral and physiological responses to noise and vibration have the potential to cause injury, energy loss (from movement away from noise source), a decrease in food intake, habitat avoidance and abandonment, and reproductive losses (National Park Service 1994).

Studies have shown that noise levels over 60 dBA can affect the behavior of certain bird species. In addition, 60 dBA has been used by the USFWS as a reference point for evaluating noise impacts on wildlife (CEC 2002a). The applicant states that average noise levels from construction could be as high as 71 dBA at 375 feet from the noise source and as high as 53 dBA at 3000 feet from the noise source (GWF 2008a, Table 5.7-7).

GWF Tracy would comply with applicable LORS that deal with noise and vibration impacts to humans. Noise and vibration levels that do not cause physical injury or harm to humans would, at a minimum, not be expected to cause injury or harm to animals. As stated, however, there are other noise- and vibration-related impacts. The construction-related vibration most likely to be perceived by wildlife off site would be pile driving, should it be employed.

Staff's assessment of potential noise and vibration impacts incorporated the following seven biological considerations: 1) that existing habitat in the project area is degraded and of low quality; 2) that the project area is essentially surrounded by agriculture and some level of development and degradation; 3) that wildlife would probably avoid the project area during the loudest construction activities; 4) that wildlife would likely habituate to construction noise to some degree or would maintain a distance comfortable to them; 5) that the project site does not provide essential habitat from which individuals would be excluded by project construction; 6) that sensitive wildlife are not expected to occur near the project area; and 7) that parts of the surrounding area are already relatively noisy (see **NOISE** section of this staff assessment). These considerations would not necessarily apply to every species or every eventuality, but they are generally true.

The applicant has proposed that noise will be monitored and when noise levels exceed 60 dBA during the breeding season, feasible noise-reduction measures (e.g., ensuring that construction equipment and mufflers are in good working condition, locating stationary equipment away from biologically sensitive areas, and use of sound barriers)

would be implemented. The applicant has committed to conducting preconstruction surveys for burrowing owls, San Joaquin kit foxes, nesting birds and raptors, and other wildlife no more than 21 days prior to ground disturbance and construction. Potential impacts to burrowing owls and San Joaquin kit foxes would be mitigated through implementation of conditions of certification **BIO-8** (preconstruction surveys), **BIO-9** (kit fox measures), and **BIO-10** (burrowing owl measures). If nesting birds are detected, then applicant-proposed noise monitoring and mitigation would be incorporated. Staff agrees with applicant-proposed noise measures, and proposes Condition of Certification **BIO-7** (impact avoidance) to further minimize impacts to nesting birds. With implementation of these measures, and given the general wildlife considerations outlined above, staff believes that noise and vibration impacts from normal project construction would be temporary and less than significant.

Construction Lighting

Lighting for project construction would occur as necessary between 6 am and 6 pm Monday through Saturday for up to 22 months. If needed, construction could potentially be extended during months 15 through 20 to as late as 9 pm Monday through Saturday. The AFC states that GWF Tracy would adhere to and maintain the actions required by each of the visual resources conditions of certification established for the TPP, especially TPP Condition of Certification **VIS-5** (GWF 2008a, p. 5.13-14). This condition required preparation of a lighting plan that stipulated, among other things, that:

- Non-glare light fixtures would be used;
- Exterior light fixtures would be hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the night sky and light trespass would be minimized;
- High-illumination areas not occupied on a continuous basis would be provided with switches or motion detectors to light the area only when occupied;
- Light height would be minimized to avoid excessive illumination;
- Lighting would be kept off when not in use;
- Lights would be removed when no longer necessary;
- Construction lighting would minimize on- and off-site glare;
- Use of searchlights, spotlights, and floodlights would be subject to review and approval by the appropriate authorities except for emergency purposes; and
- Lighting beyond construction hours would be prohibited, except lighting for security and public safety.

Staff agrees with incorporation of conditions of certification from the TPP project, especially **VIS-5** from the TPP plan, and with staff-proposed Condition of Certification **VIS-5** in the **VISUAL RESOURCES** section of this GWF Tracy staff assessment. With implementation of these measures and given the seven general wildlife considerations discussed above under **CONSTRUCTION NOISE AND VIBRATION** (ie, that the site is already degraded and does not provide essential wildlife habitat, and that most sensitive wildlife could avoid the area if construction activities were disturbing), staff believes that the impact of construction night lighting on wildlife would be less than significant.

Reconductoring Impacts

Under the Warren-Alquist Act, Energy Commission authority on siting projects includes all project elements up to and including the first point of interconnection with the existing electrical grid. For GWF Tracy, the first point of interconnection would be the Lammers Substation. The reconductoring elements of the GWF Tracy project all take place beyond the Lammers Substation and are therefore outside of Energy Commission jurisdiction. Consultation and permitting for potential reconductoring impacts would take place under the *Pacific Gas and Electric San Joaquin Valley Operation and Maintenance Habitat Conservation Plan* (PG&E 2007), also referred to as the PG&E HCP.

Electric interconnection would entail reconductoring two segments (segments 2 and 3) of existing 115-kilovolt (kV) PG&E transmission line totaling approximately three miles. An additional reconductoring segment, Segment 1, was proposed in the AFC and included in the preliminary staff assessment. It is no longer part of the project because the overload on this segment was determined to be a pre-project overload and is therefore not related to GWF Tracy (CH2M 2009d). PG&E will reconductor this segment some time in 2009. Segments 2 and 3, the remaining two segments, are approximately 0.7 miles and 1.6 miles long respectively and would be near the intersection of I-5 and I-205 near the Kasson Substation. Staff discusses potential impacts and makes recommendations for minimizing impacts of reconductoring but does not propose conditions of certification.

Reconductoring would involve replacing existing conductors with those of larger ampacity. From 4 to 8 pull sites would be required. Each pull site would be approximately 100 feet square, comprising approximately 0.2 acres (CH2M 2009c). Pull sites generally include a small staging area for a truck-mounted wire puller and support vehicles. Reconductoring would remove old conductors and install new ones. No other tower work would be involved. Ground-disturbing activities would be limited to parking vehicles along the alignments, and would require minimal vegetation disturbance and ground leveling. Most of the alignment follows existing busy roads and active agricultural fields, so pull sites would most likely be in previously disturbed areas.

The towers and substations along the reconductoring segments provide potential roosting and nesting opportunities for common and special-status birds, and special-status animals, such as burrowing owls and kit foxes, could potentially use areas near pull sites. Segment 2 lies entirely within developed and degraded areas and reconductoring would not affect sensitive habitats as currently proposed, although it could potentially disturb local sensitive species.

Segment 3 crosses three sensitive habitats: the riparian corridors of both Tom Paine Slough and Paradise Cut, and a seasonal wetland just west of Tom Paine Slough. Pull sites would need to be sited outside of any riparian buffer zone required by the PG&E HCP; however, a buffer zone that simply protects physical habitats may not be adequate to avoid disturbing protected birds and animals nesting or living in riparian zones. Moreover, while pull sites themselves might be located some distance away, , the conductors that are being strung would pass directly through or over riparian habitats, which could be disturbing to nesting birds. Staff recommends that reconductoring activities be conducted outside of the nesting and breeding season. The

seasonal wetland lies just west of Tom Paine Slough under the transmission line at the edge of a fallow agricultural field. Preliminary plans provided to Energy Commission staff show that this wetland may not be affected by reconductoring (CH2M 2009c). Effects to this wetland may need to be permitted through the Army Corps of Engineers.

The northern end of Segment 3 lies adjacent to two large, degraded impoundments that could potentially support, even if only temporarily, California red-legged frogs, western pond turtles, and giant garter snakes. These species could potentially be using or moving through uplands in that area and could be harmed by vehicle or foot traffic at any pull site adjacent to the ponds. Staff recommends the presence of a qualified biological monitor during all reconductoring activities in this area.

A formal reconductoring plan is not likely to be available for more than a year from publication of this staff assessment. The exact number of pull sites and the exact acreage of temporary disturbance are not known at this time. From preliminary plans (CH2M 2009c) that present a maximum expected impact area of 0.2 acres per pull site, a minimum of 0.8 acres and a maximum of 1.6 acres could be temporarily disturbed for reconductoring.

PG&E is expected to perform the work, and environmental permitting would therefore be completed under the PG&E HCP (A. Wallace 2009c). This HCP is a 30-year permit for gas and electric operation, maintenance, and minor new construction in all or parts of nine Central Valley counties, including San Joaquin County. It ensures compliance with federal and state requirements to protect special-status plant and animal species. Compliance is based on avoidance, minimization, and mitigation of impacts. When maintenance and construction needs are identified, the work site is reviewed using a geographic information system (GIS). Once the location has been identified in the GIS, three scenarios would prompt further HCP involvement as determined by a biologist: 1) if the job is in an area of natural vegetation, 2) if HCP-covered species have been documented in the area in the last five years, as shown in the California Natural Diversity Database (CNDDB), and 3) if the work site is on protected lands. Based on the results of these three determinations, specific avoidance mitigation measures, called AMMs in the HCP, would need to be implemented by PG&E.

Operations Impacts

Direct impacts of GWF Tracy operation would be from operational noise and vibration and from lights at night. These are discussed below. Additionally, raptors and other birds could use parts of the plant for perching and, potentially, for nesting. Noncontact storm water from the plant site would be directed to an onsite evaporation/percolation basin, which would hold water temporarily following rain events. The basin would be within a fenced site but could potentially attract brief and seasonal bird activity. It is not expected to hold water long enough to attract significant numbers of birds. Staff believes that GWF Tracy would be neither an increased attractant nor an increased deterrent to local wildlife.

Operational Noise and Vibration

A power plant operates as a steady, continuous, broadband 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 noise levels at specific locations. If this comparison identifies a significant adverse impact, then feasible mitigation must be incorporated in the project to reduce or remove the impact. Design elements incorporated to control operational noise emissions include HRSG stack silencers; a noise mitigation package on the air-cooled condenser, which includes reduced-noise motors, gearboxes, and fan blades; and an equipment enclosure on the steam turbine (GWF 2008a, p. 5.7-12).

Vibration from an operating power plant could be transmitted through the ground (groundborne vibration) and through the air (airborne vibration). Vibration associated with plant operation could make adjacent uplands less suitable for occupation by burrowing birds and animals through groundborne vibration, which could affect both predators and prey, or airborne vibration could be sufficiently disturbing that foraging animals would lose adjacent areas as foraging habitat.

The operating components of a combined-cycle power plant consist of high-speed gas and steam turbine generators, compressors, and various pumps. All of this equipment must be carefully balanced to operate. Permanent vibration sensors are attached to the turbines and generators. If an imbalance were to occur, the equipment would automatically shut down (GWF 2008a, p. 5.7-13). Airborne vibration (low-frequency noise) can rattle windows and objects on shelves and can rattle the walls of lightweight structures. The GWF Tracy's chief source of airborne vibration would be gas-turbine exhaust. In a power plant such as GWF Tracy, however, the exhaust must pass through the HRSGs before it reaches the atmosphere. The HRSGs act as efficient mufflers; this makes it unlikely that GWF Tracy would cause perceptible airborne vibration effects (see **NOISE** in GWF Tracy staff assessment).

Given the seven biological considerations under **CONSTRUCTION NOISE AND VIBRATION**, design elements incorporated into the project to minimize noise and vibration, the necessity of operating components to operate without vibration, the applicant's compliance with noise LORS, and noise staff's assessment that there would be no significant noise and vibration impacts, staff believes that operational noise and vibration would not have a significant adverse effect on local wildlife. No impact avoidance, minimization, or mitigation measures are proposed beyond those conditions of certification proposed in the **NOISE** section of this staff assessment.

Operational Lighting

Artificial light at night can significantly disturb wildlife. Among other adverse effects, it can prevent nocturnal insects from eating, mating, and migrating (Eisenbeis 2002, Frank 2002); it can increase predation on nocturnal insects by entrapping them at night lights (Svensson and Rydell 1998, Frank 2002); it can affect frog, salamander, and mammal reproduction, foraging, predator avoidance, and social interactions (Beier 1995, Grigione 2002, Buchanan 2002); it can reduce dispersal, foraging, and reproductive opportunities (Grigione 2002); and it can attract birds flying at night or in inclement weather and cause both misorientation and disorientation (Rich and Longcore 2006). Lights on tall towers can result in collision (see **AVIAN COLLISION** below). San

Joaquin kit foxes and burrowing owls are primarily active at night and could be adversely affected by night lighting. This section discusses night lighting that would illuminate the ground, e.g., night lighting for human access and public safety. **AVIAN COLLISION** below discusses night lighting of tall structures.

GWF Tracy would be operational 24 hours a day, so night lighting for security would be required. As described in the AFC (GWF 2008a, § 5.13.4.3.6), lighting fixtures currently include shields and hoods to minimize backscatter light and maintain the current relatively low levels of ambient and fugitive light. The applicant has proposed that GWF Tracy would adhere to and maintain the specifications required by Condition of Certification **VIS-5** for the TPP project (GWF 2008a, p. 5.13-14). Because the purpose of additional lighting required by GWF Tracy is to illuminate the surfaces and ground plane of the facility, the lighting fixtures would be similarly shielded and hooded. All additional exterior lights would be hooded, and lights would be directed on site so that significant light or glare would be minimized. Low-pressure sodium lamps and fixtures of a non-glare type would be specified. For areas where lighting is not required for normal operation, safety, or security, switched lighting circuits would be provided, allowing these areas to remain dark at most times.

Assessment of impacts of night lighting for ground-dwelling wildlife is based on the following biological considerations: 1) that the existing site is already degraded and essentially surrounded by development or agriculture; 2) that the project site does not provide essential habitat from which individuals would be excluded by operational lights; 3) that sensitive wildlife are not expected to occur near the project area; 4) that GWF Tracy would occupy an existing lighted plant site; and 5) that affected wildlife would either habituate to any increase in lighting or would maintain their own comfortable distance.

Staff agrees with applicant-proposed incorporation of conditions of certification from the TPP project, especially **VIS-5** from the TPP plan, and with staff-proposed Condition of Certification **VIS-5** in this GWF Tracy staff assessment. With implementation of these measures, and with the five biological considerations above, staff believes that the impact of operational night lighting on ground-dwelling wildlife would be less than significant..

Avian Collision

Human structures that are significantly taller than the natural landscape pose a collision risk for birds in flight, especially on dark nights and in foggy or stormy weather with low cloud ceilings, especially if structures are lighted, and especially if the structures are tall, narrow, and difficult to detect, such as communication towers and guy wires. Lights on towers can be especially harmful because they can attract, disorient, or misorient flying birds, drawing them off course and confusing them. These effects are well documented (Rich and Longcore 2006). GWF Tracy proposes new stacks that would be 50 feet taller than the existing stacks, which are already taller than anything in the surrounding landscape.

Staff reported in the preliminary staff assessment:

> "The new 150-foot-tall stacks would have catwalks at about 135 feet that are proposed to be continually lighted at night with low-intensity indirect lighting. The other tall structures would be lighted similarly."

Pursuant to the Federal Aviation Administration *Determination of No Hazard to Air Navigation* (CH2M 2009e), which states that marking and lighting of the towers would not be necessary for aviation safety, GWF is no longer proposing to install hazard night lighting on the exhaust stacks or catwalks (CH2M 2009f) or other features of the plant (D. Wheeler pers. comm.). Task lighting would be provided but it would only be used when work is being performed, which would not be expected to occur at night. Staff believes that elimination of hazard night lighting on the exhaust stacks and at the plant significantly reduces the risk of avian collision.

Staff proposes in Condition of Certification **VIS-5** that the tallest structures (the exhaust stacks and the natural gas stack) shall not be lighted at night with hazard lighting. Only task lighting shall be provided, which would be switched on for specific tasks but would otherwise be turned off. With implementation of Condition of Certification **VIS-5**, staff believes that avian collision risk would be less than significant.

Avian Electrocution

The existing 115-kV PG&E transmission lines and towers may pose a risk of electrocution and collision, but proposed reconductoring would not increase that risk because it would not change existing conditions. The likelihood of electrocutions occurring at voltages greater than 60-kV is low because phase-to-phase and phase-to-ground clearances for lines greater than 60-kV are typically sufficient to prevent bird electrocution (APLIC 2006). Potential electrocution impacts would be mitigated by incorporating the construction design recommendations provided in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Specifically, transmission lines that have a minimum of 5.5 feet between conductor wires would minimize electrocution. This measure has been incorporated into proposed Condition of Certification **BIO-7** to minimize the risk of avian mortality from electrocution. With it, avian electrocution risk would be less than significant.

Air Emissions

Certain plant species and communities are highly sensitive to air pollutants such as carbon monoxide (CO), oxides of sulfur (SO_x), and nitrogen oxides (NO_x). Some sensitive plants live in nitrogen-limited, low-biomass plant communities that may be rare, endemic, or declining in California. Nitrogen-limited plant communities include, among others, coastal sage scrub, serpentine grassland, desert scrub, vernal pools, and bogs and other wetland habitats. A highly specialized, serpentinic plant species that can, for example, thrive in soils that are deficient in nitrogen has a competitive advantage over a fast-growing nonnative plant that requires more nitrogen. This competitive advantage could be lost when air pollution increases nitrogen deposition in that community. Increased nitrogen could then give a nonnative species a competitive

advantage over a native species allowing it to take over. Impacts could extend to such wildlife as a butterfly that depends for survival on the native species that no longer has the competitive advantage (Weiss 1999).

GWF Tracy would emit nitrogen oxides and other air pollutants during the course of normal operation. This could promote the growth of nonnative plants over native plants in the Tracy region. NO_x emissions were fully offset for the TPP. For GWF Tracy, the applicant has provided over 53 tons per year of excess NO_x mitigation beyond the amount required (GWF 2008a, p. 5.2-26); however, NO_x offsets and mitigation credits would not necessarily reduce impacts in the immediate vicinity of GWF Tracy. Staff nevertheless believes that air emissions would not be a significant project effect to sensitive plants or plant communities. This is because the project would minimize air pollutant emissions using best-available control technology and would comply with air-quality standards, and because there are no nitrogen-limited or otherwise sensitive habitats within at least five miles of the project site. With applicant-proposed measures and staff's proposed conditions of certification in the **AIR QUALITY** section of this staff assessment, staff believes that air emissions would not adversely affect biological resources at GWF Tracy.

CUMULATIVE IMPACTS

A project could result in a significant adverse cumulative impact where its effects are cumulatively considerable. Cumulatively considerable means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, of other current projects, and of probable future projects (California Code of Regulations, Title 14, section 15130). The proposed GWF Tracy site is located adjacent to agricultural fields, the Owens-Brockway Glass Container manufacturing plant, the Nutting-Rice Warehouse, and the Tracy Biomass Power Plant, and it is 1.5 miles from a meat packing plant. The proposed project would be modifying an existing power plant in an industrialized area. A cumulatively considerable impact to biological resources would be a significant loss of denning, nesting, foraging, or other essential habitat for special-status species that was not mitigated to a less-than-significant level.

Three development projects in San Joaquin County and seven development projects in the city of Tracy are currently proposed or underway in the vicinity of GWF Tracy. With the exception of reconductoring, which will be completed outside of Energy Commission authority, GWF Tracy would be constructed entirely within the previous TPP development. Construction would temporarily disturb 12.3 acres of ruderal upland that would be restored to pre-project conditions at the end of construction. Construction would permanently remove 3.28 acres of ruderal upland. Temporary and permanent impacts to habitats all take place within the 34.6 acres of habitat that were mitigated for the TPP. These impacts would not require additional mitigation. No other essential habitats would be affected.

Staff believes that the project would not contribute to cumulatively considerable impacts for two reasons: 1) disturbance and construction impacts would be minimized through implementation of proposed conditions of certification, and 2) only 3.28 acres of ruderal upland habitat would be permanently lost and loss of those acres were mitigated at the time of the TPP.

COMPLIANCE WITH LORS

This section is based on the laws, ordinances, regulations, and standards (LORS) provided in **Biological Resources Table 1** above. Construction and operation of GWF Tracy would take place entirely within areas previously disturbed for construction and operation of the TPP. Environmental permitting for TPP was completed through the San Joaquin Council of Governments under the San Joaquin Multi-species Conservation Plan (SJCOG 2000) and it covered the entire parcel owned by GWF Energy, LLC. Under the SJMSCP, the applicant would not be required to mitigate further for any activity conducted on those same acres. The requirements of that permit for protection of special-status wildlife on the site still apply and must be implemented again for any subsequent project, but no further environmental consultation and permitting would be required by SJCOG.

The GWF Tracy project would be in compliance with all state, federal, and local LORS related to biological resources.

RESPONSE TO PUBLIC COMMENTS

A written comment (HSM 2009a) on the preliminary staff assessment was provided by the law offices of Hefner, Stark & Marois, LLP, on behalf of Tracy Hills, LLC, developer of the Tracy Hills development project. The comment relates primarily to visual resources, but visual-resource mitigation could affect biological resources. The comment is summarized below and a staff response is then provided.

Tracy Hills comment: The letter states that the Tracy Hills development project has been approved and was considered a probable future project in the cumulative impacts section of the GWF Tracy preliminary staff assessment. The letter documents the concerns of cumulatively considerable impacts of the proposed project on the Tracy Hills development, and the commenters insist that feasible mitigation be required to address those impacts. The commenters request that trees be planted along the Delta-Mendota Canal. They recognize that there may be agency restrictions on the types of trees planted along the canal because of potential predation impacts to San Joaquin kit foxes, but request that Energy Commission staff further explore possible visual mitigations.

Staff response: The San Joaquin Kit Fox Planning and Conservation Team, a partnership of kit fox experts and federal, state, and local jurisdictions, has identified several migration corridors in the Tracy area that are important for kit fox recovery (CEC 2002b). One of them is the Delta-Mendota Canal. Trees may provide perches for raptors and raptors are known to sometimes prey on kit foxes. While avian predators such as owls and other raptors do occur in native kit fox habitats, kit foxes evolved in an essentially treeless landscape and would not be expected to have an appropriate natural wariness of landscape features, such as trees, fence posts, and poles, that could provide perching opportunities for avian predators.

Addressing comments from the US Fish and Wildlife Service on the kit fox, the 2002 supplement to the staff assessment for TTP (SJCOG 2002) states that the applicant agreed to:

1. "place the project as far as feasible from the Delta Mendota Canal, maximizing the width of the kit fox migration corridor" and

2. "eliminate from their landscaping plan any landscaping trees near the canal."

It should be further noted that the San Luis and Delta-Mendota Water Authority would not allow any tree plantings within the canal right-of-way (A. Wallace 2009d).

As described below under **CONCLUSIONS**, the US Fish and Wildlife Service requested that TPP leave a 300-foot-wide corridor between the power plant and the Delta-Mendota Canal for the kit fox. The final project resulted in a corridor that was only approximately 225 feet wide and the applicant provided an additional 0.9 acres of mitigation to compensate for this loss of corridor habitat.

Staff believes that the kit fox corridor along the Delta-Mendota Canal is at least as essential for kit foxes now as it was at the time of the TPP project, that the US Fish and Wildlife Service will be as concerned about kit fox protection and recovery now as it was then, and that it will not want trees to be planted along the Delta-Mendota Canal. Staff believes that the corridor along the canal should not be further compromised.

NOTEWORTHY PUBLIC BENEFITS

There are no noteworthy public benefits associated with the GWF Tracy project as it relates to biological resources.

CONCLUSIONS

The proposed GWF Tracy project comprises three primary elements: 1) construction and demolition associated with converting the existing TPP from a simple-cycle plant to a combined-cycle plant, 2) reconductoring existing transmission lines in two discrete locations, and 3) plant operation. All of these activities take place within previously disturbed areas, and habitat impacts associated with power-plant construction have previously been mitigated through the San Joaquin Multi-species Conservation Plan (SJCOG 2000).

Other impacts could include potential temporary and permanent loss of dens or nesting and breeding habitat for a variety of special-status terrestrial wildlife that could use the onsite uplands; potential construction-related noise, vibration, night lighting, and disturbance of wildlife using adjacent areas; potential operations-related noise, vibration, and night lighting; and potential avian collision with the new exhaust towers and other tall structures. These would be avoided, minimized, or mitigated through implementation of the measures required by SJCOG for TPP construction, and through implementation of the conditions of certification proposed in this staff assessment.

It was resolved through informal consultation (A. Wallace 2009a, 2009b) that USFWS and CDFG would defer to SJCOG for all formal consultation for the GWF Tracy project.

Because project construction and operation takes place entirely on acreage that has already been through the SJCOG permitting process, no further agency consultation would be required for construction and operation. Permitting for reconductoring is beyond Energy Commission jurisdiction. It would be completed by PG&E and permitted under the current PG&E HCP. However, staff recommends that reconductoring activities be conducted outside of the nesting and breeding season. Additionally, staff recommends the presence of a qualified biological monitor during all reconductoring activities adjacent to the impoundment at the north end of Segment 3.

PROPOSED CONDITIONS OF CERTIFICATION

Staff proposes the following biological resources conditions of certification.

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall assign a Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) for approval. The Designated Biologist must have the following minimum qualifications:

1. A 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; and

3. At least one year of field experience with biological resources found in or near the project area.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Verification: The project owner shall submit the specified information at least 90 days prior to the start of any site mobilization. No site or site-related activities shall commence until an approved Designated Biologist is available to be on site. If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least 10 working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may

be assisted by approved biological monitors, but remains the contact for the project owner and CPM. The Designated Biologist shall:

1. Advise the project owner's construction/operation managers on the implementation of biological resource conditions of certification;

2. Consult on the preparation of the biological resource mitigation implementation and monitoring plan (BRMIMP), to be submitted by the project owner;

3. Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources such as special-status species or their habitats;

4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

5. Inspect active construction areas where animals may have become trapped prior to commencement of construction each day;

6. Inspect for installation of structures that prevent entrapment or allow escape during periods of construction inactivity at the end of each day;

7. Periodically inspect areas with high vehicle activity (i.e., parking lots) for animals in harm's way;

8. Notify the project owner and CPM of any noncompliance with any biological resource condition of certification;

9. Respond directly to inquiries of the CPM regarding biological resource issues;

10. Maintain written records of the tasks specified above and those included in the biological resources mitigation implementation and monitoring plan (BRMIMP), with summaries of these records submitted in the monthly compliance report and the annual report; and

11. Train the biological monitors as appropriate, and ensure their familiarity with the BRMIMP, worker environmental awareness program (WEAP), and all permits.

Verification: The Designated Biologist shall submit in the monthly compliance report to the CPM copies of all written reports and summaries that document biological resource activities. If actions may affect biological resources during operation, a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the annual compliance report unless their duties are ceased as approved by the CPM.

BIOLOGICAL MONITOR SELECTION

BIO-3 The project owner's CPM-approved Designated Biologist shall submit the resume, at least three references, and contact information for the proposed biological monitors to the CPM for approval. The resume shall demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the assigned duties. Biological monitor training by the Designated Biologist shall include familiarity with the conditions of certification and the BRMIMP, WEAP, and all permits.

Verification: The project owner shall submit the specified information to the CPM for approval at least 30 days prior to the start of any site mobilization. The Designated Biologist shall submit a written statement to the CPM confirming that individual biological monitors have been trained, including the date when training was completed. If additional biological monitors are needed during construction, the specified information shall be submitted to the CPM for approval 10 days prior to their first day of monitoring activities.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-4 The project owner's construction/operation managers shall act on the advice of the Designated Biologist and biological monitors to ensure conformance with the biological resources conditions of certification. If required by the Designated Biologist and biological monitors, the project owner's construction/operation managers shall halt site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

- Require a halt to all activities in any area when there would be an unauthorized adverse impact to biological resources if the activities continued;
- Inform the project owner and the construction/operation managers when to resume activities; and
- Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or shall be instituted, as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the biological monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that the Designated Biologist or biological monitor 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 noncompliance 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 shall be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner shall be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-5 The project owner shall develop and implement a CPM-approved worker environmental awareness program (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 onsite or training center presentation in which supporting written material and electronic media are 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 acceptable to the Designated Biologist.

Verification: At least 60 days prior to the start of any site mobilization, the project owner shall provide to the CPM two copies of the proposed WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the persons 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. At least 10 days prior to site mobilization, the project owner shall submit two copies of the CPM-approved materials. The signed training acknowledgement forms from construction 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

BIO-6 The project owner shall submit two copies of the proposed biological resources mitigation implementation and monitoring plan (BRMIMP) to the CPM for review and approval, and to the San Joaquin Council of Governments (SJCOG), the US Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG) for review and comment,

and shall implement the measures identified in the approved BRMIMP. The BRMIMP shall be prepared in consultation with the Designated Biologist, shall include all measures contained in the BRMIMP for the TPP project, and shall identify:

1. All applicant-proposed mitigation, monitoring, and compliance measures included as part of the project description in the AFC, which include all measures required for TPP construction and operation;

2. How noise will be monitored, including specific mitigation for noise levels that exceed 60 dBA;

3. All biological resource conditions of certification, including any measures provided in consultation with SJCOG;

4. All biological resource mitigation, monitoring, and compliance measures required by the *San Joaquin County Multi-species Habitat Conservation and Open Space Plan* (SJMSCP) for each species listed in **Biological Resource Table 2** above for which measures are described, including exclusion zones around nests or colonies for special-status species – each species shall be named specifically with its SJMSCP-required incidental take minimization measures provided (see SJCOG 2002);

5. All biological resource mitigation, monitoring, and compliance measures required in terms and conditions of other state agencies commenting or permitting the project;

6. All biological resource mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements;

7. All mitigation, monitoring, and compliance measures required for protection of San Joaquin kit foxes and burrowing owls as discussed in conditions of certification **BIO-8**, **BIO-9**, and **BIO-10** below;

8. Required habitat-compensation strategy, including provisions for acquisition, enhancement, and management for any temporary and permanent loss of sensitive biological resources;

9. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

10. 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;

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 and 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 preliminary discussion of biological resource-related facility closure measures;

15. A landscaping plan that follows the TPP USFWS recommendations for maintenance of appropriate habitat character for the San Joaquin kit fox (see CEC 2002b);

16. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval;

17. A copy of all biological resource-related permits obtained; and

18. A description of impact avoidance, minimization, and mitigation measures for noise and lighting impacts.

Verification: The project owner shall provide the specified document at least 60 days prior to start of any site mobilization. The CPM, in consultation with the SJCOG (and USFWS, and CDFG if they choose to comment), shall determine the BRMIMP acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM and the SJCOG within five days of their receipt and the BRMIMP shall be revised or supplemented to reflect the permit condition within 10 days of their receipt by the project owner. Ten days prior to mobilization of the site and related facilities, the revised BRMIMP shall be resubmitted to the CPM.

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 and submitted to the SJCOG, USFWS, and CDFG to ensure that no conflicts exist.

Implementation of BRMIMP measures shall be reported in the monthly compliance reports by the Designated Biologist (i.e., survey results, construction activities that were monitored, species observed). Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction closure 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.

IMPACT AVOIDANCE MITIGATION MEASURES

BIO-7 When a project is modified or a project design is finalized, it shall incorporate all feasible measures that avoid or minimize impacts to the local biological resources, including the following::

1. Design, install, and maintain transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources;

2. Design, install, and maintain transmission lines and all electrical components in accordance with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) to reduce the likelihood of electrocutions of large birds;

3. Grade and clear construction areas between September 1 and January 31, if possible, to minimize impacts to nesting birds;

4. Eliminate from landscaping plans any List A California exotic pest plants of concern as defined by the California Exotic Pest Plant Council;

5. prescribe a road sealant that is nontoxic to wildlife and plants that will limit dust on dirt roads;

6. Implement all incidental take minimization measures developed by SJCOG for the TPP project in 2002 (SJCOG 2002) prior to any ground disturbance;

7. Implement the applicant-proposed measures discussed in GWF 2008a, the application for certification, which are summarized above under Construction Impacts to General Wildlife; and

8. Submit any plans for landscaping anywhere in the kit fox corridor between the plant itself and the Delta-Mendota Canal to the US Fish and Wildlife Service and California Department of Fish and Game for specific approval prior to implementation.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how impact avoidance measures were completed.

PRE-CONSTRUCTION SURVEYS

BIO-8 Pursuant to the *San Joaquin County Multi-species Habitat Conservation and Open Space Plan* (SJMSCP) and the requirements of the San Joaquin Council of Governments (SJCOG), all incidental take minimization measures for pre-construction surveys provided by SJCOG for TPP shall be implemented for the GWF Tracy project. These include but are not limited to the following (SJCOG 2002). .

1. Notify SJCOG of plans to commence ground disturbance to allow for preconstruction surveys for the San Joaquin kit fox (kit fox). If surveys identify potential dens, den entrances shall be dusted for three calendar days to register tracks of any kit fox present. If no kit fox activity is identified, potential dens may be destroyed. If kit fox activity is identified, dens shall be monitored to determine if occupation is by an adult fox only or is a natal den. If the den is occupied by an adult only, the den may be destroyed when the adult fox has moved or is temporarily absent. If the

den is a natal den, a buffer zone of 250 feet shall be maintained around the den(s) until the biologist determines that the den has been vacated. Where kit foxes are identified, the provision of the US Fish and Wildlife Service's published *Standardized Recommendation for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 1999) shall apply.

2. Notify SJCOG of plans to commence ground disturbance to allow for preconstruction surveys for the burrowing owl. If burrowing owls are found, follow condition 3 in SJCOG 2002.

3. Prior to commencing ground disturbance, the construction team shall meet with SJCOG to discuss minimization measures designed to avoid impacts to the kit fox. The SJCOG biologist shall be present at the meeting to conduct kit fox education.

Verification: At least 14 days prior to the expected start of any project-related site mobilization, the project owner shall provide the CPM, USFWS, and CDFG with the results of preconstruction surveys and identify any mitigation measures to be employed as provided in these conditions of certification.

AVOID HARASSMENT OR HARM TO SAN JOAQUIN KIT FOXES

BIO-9 The project owner shall manage the construction site and related facilities in a manner to avoid or minimize impacts to the San Joaquin kit fox by following the incidental take minimization measures developed by SJCOG for TPP (SJCOG 2002), which requires implementing the USFWS 1999 guidelines entitled *Standardized* Recommendations *for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 1999). Measures provided by SJCOG include but are not limited to the following.

1. During construction, all pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at the construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before using or moving the equipment or materials. If a kit fox is discovered, then the materials or equipment shall not be moved until consultation with the US Fish and Wildlife Service. If necessary, under the direct supervision of the SJCOG biologist, the equipment may be moved once to remove it from the path of construction activity until the fox escapes.

2. .During construction, all food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in closed containers and removed at least once a week from the construction site.

3. After construction, SJCOG shall notify the USFWS and CDFG within 24 hours of receiving a report of incidental take occurring at the project site after project construction. SJCOG, the project proponent, and the permitting agencies shall meet within two weeks to discuss adaptive management measures that may be undertaken to reduce or eliminate future incidents of incidental take.

Verification: All incidental take minimization measures provided by the SJCOG consultant shall be included in the BRMIMP. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. Within 30 days after completion of project construction and reconductoring, the project owner shall provide to the CPM and SJCOG, for review and approval, a written construction termination report identifying how all biological resource-related conservation measures were completed.

BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-10 The project owner shall manage the construction site and related facilities in a manner to avoid or minimize impacts to the burrowing owl by following the SJCOG incidental take minimization measures developed for the TPP project in 2002 (SJCOG 2002), specifically conditions 3 and 6, which are provided below.

1. During the nonbreeding season (September 1 through January 31), burrowing owls found during preconstruction surveys to be occupying the project site shall be evicted by passive relocation as described in the California Department of Fish and Game *Staff Report on Burrowing Owls* (CDFG 1995).

2. During the breeding season (February 1 through August 31), occupied burrows shall not be disturbed and shall be provided with a 75-meter protective buffer until and unless the TAC, with the concurrence of the permitting agencies' representatives on the TAC, or unless a qualified biologist approved by the permitting agencies, verifies through noninvasive means that either the birds have not begun egg laying or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Once fledglings are capable of independent survival, the burrow can be destroyed.

3. During construction, all food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in closed containers and removed at least once a week from the construction site.

Verification: The project owner shall submit a report to SJCOG and the CPM at least 30 days prior to the start of site mobilization that describes survey methods, results, and conservation or mitigation measures. If owl relocation is necessary, the project owner shall coordinate with SJCOG on the number of new burrows, their locations, and how any created burrows and compensation land shall be protected for the life of the project in a burrowing owl mitigation and monitoring plan. Within 30 days after completion of owl relocation and monitoring and the start of ground disturbance, the project owner shall provide written verification to the SJCOG and CPM that burrowing owl mitigation measures have been completed.

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ACRONYMS LIST

AFC	Application for certification
BRMIMP	Biological resources mitigation implementation and monitoring plan
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CPM	Compliance project manager
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FSA	Final Staff Assessment
HCP	Habitat conservation plan
HRSG	Heat recovery steam generator
ITP	Incidental take permit
LORS	Laws, ordinances, regulations, and standards
MBTA	Migratory Bird Treaty Act
NCCP	Natural community conservation plan
PG&E	Pacific Gas & Electric
PSA	Preliminary Staff Assessment
RWQCB	Regional Water Quality Control Board
SJCOG	San Joaquin Council of Governments
SJMSCP	San Joaquin County Multi-species Habitat Conservation and Open Space Plan
TPP	Tracy Peaker Plant
US	United States
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USFWS	United States Fish and Wildlife Service
WEAP	Worker environmental awareness program

CULTURAL RESOURCES

Testimony of Beverly E. Bastian

SUMMARY OF CONCLUSIONS

Staff has determined that the proposed GWF Tracy Combined-Cycle Power Plant Project (GWF Tracy) would have no impact on known archaeological resources, built-environment resources, ethnographic resources, historic districts, or cultural landscapes that are or could be eligible for the California Register of Historical Resources (CRHR).

To facilitate the identification and assessment of previously unidentified archaeological resources encountered during construction in previously undisturbed areas and to mitigate any significant impacts from the project on any newly found resources assessed as CRHR-eligible, staff recommends that the Commission adopt the following cultural resources Conditions of Certification, **CUL-1** through **CUL-7**. These conditions provide for the hiring of a Cultural Resources Specialist and archaeological monitors, for cultural resources awareness training for construction workers, for the archaeological and Native American monitoring of ground-disturbing activities, for the recovery of data from CRHR-eligible discovered archaeological deposits, for the writing of a technical archaeological report on all archaeological activities and findings, and for the curation of recovered artifacts and other data. When properly implemented and enforced, staff believes that these conditions of certification would reduce to less than significant any impacts to previously unidentified cultural resources encountered during construction or operation. Additionally, with the adoption and implementation of these conditions, the proposed GWF Tracy project would be in conformity with all applicable laws, ordinances, regulations, and standards.

INTRODUCTION

This cultural resources assessment identifies the potential impacts of the GWF Tracy project on cultural resources. Cultural resources are defined under state law as buildings, sites, structures, objects, and historic districts. Three kinds of cultural resources, classified by their origins, are considered in this assessment: prehistoric, ethnographic, and historic.

Prehistoric archaeological resources are associated with the human occupation and use of California prior to prolonged European contact. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 12,000 years ago and extended through the eighteenth century until 1769, when the first Europeans settled in California.

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

Historic-period resources, both archaeological and architectural, are associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity. Groupings of historic-period resources are also recognized as historic districts and as historic vernacular landscapes. Under federal and state historic preservation law, cultural resources must be at least 50 years old to have the potential to be of sufficient historical importance to merit consideration of eligibility for listing in the California Register of Historical Resources (CRHR). A resource less than 50 years of age must be of exceptional historical importance to be considered for listing.

For the GWF Tracy project, staff provides an overview of the environmental setting and history of the project area, an inventory of the cultural resources identified in the project vicinity, and an analysis of the potential impacts to cultural resources from the proposed project using criteria from the California Environmental Quality Act (CEQA).

If cultural resources are identified, staff determines which are historically significant (defined as eligible for the CRHR) and whether the GWF Tracy would have a significant impact on those that are eligible. Staff's primary concern is to ensure that all potentially CRHR-eligible cultural resources are identified, that all potential GWF Tracy impacts to those resources are identified and assessed, and that conditions are proposed that ensure that all significant impacts that cannot be avoided are mitigated to a less-than-significant level.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Projects licensed by the Energy Commission are reviewed to ensure compliance with all applicable laws. For this project, which has no federal involvement,[1] the applicable laws are primarily state laws. Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies.

[1] Cultural resources in California are also protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, Section 431 et seq.) and subsequent related legislation, policies, and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act.

Cultural Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
State	
Public Resources Code 5097.98 (b) and (e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until he/she confers with the Native American Heritage Commission-identified Most Likely Descendents (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to re-inter the remains elsewhere on the property in a location not subject to further disturbance.
Health and Safety Code, section 7050.5	Makes it a misdemeanor to disturb or remove human remains found outside a cemetery; also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.
Local	
San Joaquin County General Plan, Sections G and H	The county follows all provisions of CEQA. The General Plan Heritage Resource section details the county's goals with respect to the preservation of significant historical and archaeological sites and structures in the county. Section G lists San Joaquin County resources listed on the National Register of Historic Places, as well as local historic points of interest and local historic landmarks.
City of Tracy Municipal Code, Ordinance 1048; City of Tracy General Plan. Land Use Element	With Ordinance 1048, the City adopted the California Historic Building Code (Health and Safety Code, § 18950 et seq.) by reference. In its General Plan, the City of Tracy encourages preservation of historical resources by providing information regarding historic and cultural resources. The City of Tracy does not maintain a list of recognized historical resources.

SETTING

Information provided regarding the setting of the proposed project places it in its geographical and geological context and specifies the technical description of the project. Additionally, the archaeological, historical, and ethnographic background provides the context for the evaluation of the CRHR eligibility of any identified cultural resources within staff's area of analysis for this project.

REGIONAL SETTING

The proposed project is located in the Central Valley Physiographic Province of California, on the northwestern edge of the San Joaquin Valley on the boundary between the Coast Mountain Ranges to the west and south and the Great Valley to the east and north. The valley is a vast trough filled with sedimentary deposits, the oldest of marine origin and the youngest, of Quaternary age, resulting from the erosion of the surrounding mountains and deposition of the eroded material as alluvium. In the Tracy area, the west side of the valley is formed by a sequence of alluvial fan deposits.

Previous geotechnical studies at the proposed project site revealed a layer of moderate to highly expansive clay located above an alluvial sequence of silt, clay, sand, and gravel (GWF2008a, pp. 5.8-5–5.8-6).

VICINITY, SITE, AND PROJECT DESCRIPTION

The proposed plant would occupy a 16.4-acre fenced site within the 40-acre parcel of the existing Tracy Peaker Plant (TPP), which was approved by the Energy Commission on July 17, 2002 (GWF2008a, p. 1-1), and has been operating since April of 2003. The TPP is located within an unincorporated area of San Joaquin County, southwest of the City of Tracy, outside the city limits, but within the sphere of influence of the City. A 3,300-foot asphalt service road running south from West Schulte Road provides access to the TPP plant site and would also serve the proposed GWF Tracy plant site (GWF2008a, pp. 2-1, 2-3). The proposed GWF Tracy plant site is relatively flat, ranging in elevation between 155 and 180 feet above mean sea level and sloping slightly to the northeast (GWF2008a, p. 5.4-3). The site has a 4-foot layer of fill over the entire surface, applied during the construction of the existing TPP (GWF2008a, p. 5.8-9).

The TPP parcel is bordered on the north by the Union Pacific Railroad (UP), on the south and east by agricultural land, and on the southwest by the Delta Mendota Canal. The TPP parcel was previously undeveloped and used for agriculture prior to TPP construction (Egherman 2001, p. C-4). Surrounding land use is dominated by irrigated agricultural properties, but residential and industrial properties are also present. Industrial properties of note near the TPP site are the Union Pacific Railroad and the Owens-Brockway glass container manufacturing plant, located north of the Union Pacific Railroad. In the area where the transmission line reconductoring would be done, the Western Pacific Railroad is located southeast of the Schulte-Lammers 115-kV line (part of which is proposed for reconductoring), and the Kasson Substation is located near the junction of Interstate 5 and Kasson Road. The Deuel Vocational Institution, a California State Prison, is also in this area, located directly east of the Kasson Substation. A sewage disposal facility is located to the northeast of the institution (GWF2008a, fig. 1.1-3).

The GWF Tracy project would entail the modification of the combustion turbines of the currently operating TPP and the reconductoring of three segments of nearby transmission lines to accommodate the additional output from the modified plant. TPP modifications would include the replacement of existing emissions control equipment with more efficient equipment and the addition to the two existing combustion turbine generators of new heat recovery steam generators whose output would run a new steam turbine generator, resulting in the conversion of a 169-megawatt (MW) simple-cycle facility into a 314-MW combined-cycle facility. Other major alterations at the TPP site would include adding a new air-cooled condenser, relocating the stormwater percolation/evaporation pond, and adding water treatment and storage facilities. Additionally, the proposed project would temporarily use another 12.3 acres, east of the existing plant, of the TPP 40-acre parcel as a laydown area (GWF2008a, pp. 2-1–2-2; fig. 1.1-4).

Transmission expansions and upgrades include a new, on-site,115-kilovolt (kV) switchyard, a new, on-site, 115-kV overhead transmission line, expansion of the existing

PG&E Schulte Switching Station, a new, off-site, overhead transmission line (gen tie) to connect the project to the existing 115-kV Tesla-Manteca transmission line, and the reconductoring of three short segments of existing transmission line downstream of the first point of interconnection (GWF2008a, pp. 2-1–2-2). The two segments would be (GWF2008a, p. 3-1; fig. 1.1-3):

- TL2, an approximately 0.7-mile segment of the Vierra-Tracy-Kasson 115-kV transmission line near the Kasson Substation; and
- TL3, an approximately 2.5-mile segment of the Vierra-Tracy-Kasson 115-kV transmission line running parallel to I-5 adjacent to Mossdale Road.

GWF Tracy's project-related construction of linear facilities would be limited to the gen tie and the reconductoring of three segments of existing transmission line. All other supply and transmission lines would be constructed or are already present on the existing TPP site. Natural gas would be provided to GWF Tracy by the existing PG&E Line 2 gas pipeline, which passes through TPP's 40-acre parcel. No new, expanded or modified off-site linear facilities for fuel or water are being proposed (GWF2008a, pp. 2-1 – 2-2).

Prehistoric Background

Human Occupation in the Northwestern San Joaquin Valley

The late Quaternary (the Holoceneepoch—about 11,000 years ago) landscapes of the Central Valley are fairly uniform, consisting of a fringe of geologically old, weathered piedmonts around the periphery and comparatively young, active basins and floodplains on the valley bottom (Rosenthal, et al., 2007, p. 147). The GWF Tracy project vicinity contains both types of landforms within a 17-square-mile area, which probably made it subject to a higher than normal rate of alluvial deposition. Supporting this presumption is the fact that geologists have not detected peat accumulations, characteristic of the wetland environs found farther north in the valley, in the vicinity of the project (Wohlgemuth and Mears 1994, p 1).

Archaeologists have noted throughout the Central Valley that the elevated natural levees of floodplain environments were favored for prehistoric habitation (Cook and Heizer 1951; Moratto 1984, pp. 172–173; Rosenthal, et al., 2007, p. 147), and the mounds that were found along rivers were the focus of most of the archaeological work in the valley from the late nineteenth-century up through the mid-twentieth century, leaving considerable valley territory poorly explored by archaeologists. With mound sites representing villages found near the rivers, the archaeological evidence found in other parts of the valley, such as the vicinity of the proposed GWF Tracy project, would be expected to represent activities complementary to the dominant riverine adaptation: short-term resource-exploitation camps, task-specific localities such as milling stations and knapping stations, and isolated artifacts (Reno 2003, p. 4). But a recent review of the status of archaeology in the Central Valley identified reasons why the area remains enigmatic (Rosenthal, et al. 2007, pp. 149-150):

- Surface sites have been mostly destroyed by agriculture, levee construction, and river erosion;

- Sampling biases of early excavations emphasized artifacts and burials over such evidence as food remains and technological features, resulting in a lack of data appropriate to reconstructing a full picture of prehistoric lifeways; and
- Geological processes have hidden older sites under deposited alluvium, leaving only more recent ones on the surface of the young sediments, representing only the past 2,500 years or so, or, in a few cases, 5,500 years ago.

As a result of these circumstances, the locale of the proposed GWF Tracy project is both poorly known archaeologically and likely to have such evidence of early prehistoric activities as might exist there be buried under more recent alluvium.

The archaeological culture sequence appropriate to the proposed GWF Tracy project area is that formulated by archaeologists for the San Joaquin-Sacramento River Delta. The Delta, during the Holocene, has been characterized by sloughs, braided stream channels, and wetlands created by the confluence of the San Joaquin and Sacramento Rivers (Wohlgemuth and Mears 1994, p. 1), and this environment has provided rich resources which prehistoric Native Americans exploited for more than 5,000 years (Moratto 1984, p. 214; Rosenthal, et al., 2007, p. 151). Beginning in the 1930s, archaeologists have identified an archaeological culture sequence for the Delta vicinity based on artifact types and mortuary practices that appear to be temporally sensitive. Their studies have also helped to define general settlement and subsistence patterns associated with these periods based on functional analyses of artifact assemblages and environmental reconstructions. The sequence is divided into three horizons: the Early Period, or Windmiller Pattern; the Middle Period, or Berkeley Pattern; and the Late Period, or Augustine Pattern. For ease of identification and regional specificity, the pattern names will be used here.

Pre-Windmiller Cultures (9,550–3550 BC)

Although there are provisional data suggesting the valley was inhabited as early as 11,500 years ago (Moratto 1984, p. 214; Rosenthal, et al., 2007, p. 151), a combination of depositional and erosional geological forces have succeeded in rendering traces of this early lifeway elusive. Thus, the archaeological sequence for the Delta subregion of the Central Valley generally begins about 5,500 years ago (approximately 3550 BC) with the emergence of the Windmiller Pattern.

Windmiller Cultures (3550–550 BC)

Windmiller sites generally date between 3550 and 550 BC and are well represented in the project region (Wolhgemuth and Mears 1994, p. 6-7; Rosenthal, et al., 2007, p. 153). Six of the 12 known Windmiller sites are in the Stockton area, including CA-SJO-91 in French Camp, located less than five miles to the north of the GWF Tracy's transmission line segments, TL2 and TL3, proposed for reconductoring (Napton 2006, pp. 6–7; Wolhgemuth and Mears 1994). Windmiller sites indicate that subsistence was based on a variety of food resources that included many kinds of fish, birds, and mammals. Seeds, roots, and acorns are believed to have been important dietary elements as well, despite the paucity of milling equipment associated with Windmiller sites (Rosenthal, et al., 2007, p. 155). These dietary remains also indicate a more sedentary, year-round settlement pattern. Windmiller groups in the Delta had extensive trade networks which focused on acquiring both utility goods, such as obsidian for

toolstone, and ornamental and ceremonial objects, such as abalone shell, olivella shell beads, and quartz crystals (Moratto 1984; Wolhgemuth and Mears 1994; Rosenthal, et al., 2007). Their mortuary complex is characterized by fully extended burials, placed face down, with the head in a westerly orientation. Grave goods were common. The use of red ochre has also been frequently documented (Ragir 1972; Fredrickson 1973; Moratto 1984; Rosenthal, et al., 2007).

Berkeley Cultures (550 BC–-450 AD)

In contrast to Windmiller Pattern sites, the abundance of milling equipment, particularly mortars and pestles, found at Berkeley Pattern sites indicates a reliance on plant resources, especially acorns, as dietary staples (Moratto 1984, pp. 209–210; Wohlgemuth and Mears 1994, p. 7; Rosenthal, et al., 2007, p. 156). Other technological differences include a highly developed worked-bone industry, distinctive diagonal flaking patterns on large concave-base projectile points, and split-punched and saddle-shaped Olivella shell beads (Moratto 1984, p. 210). The contrasts continue into mortuary patterns, where the dead are generally interred in a flexed position with variable orientation and fewer grave goods. Berkeley Pattern sites are the remains of large mounded villages with extensive accumulations of habitation debris and hearths. This information, combined with the evident technological complexity, indicates that Berkeley Pattern peoples were living in the same areas, not only year-round, but for long periods of time (Rosenthal, et al., 2007, p. 156).

Augustine Cultures (450~1769 AD)

Settlement and subsistence intensification continued on into the Augustine Pattern which begins around 450 AD and lasts until historic times, usually demarcated by the inception of Spanish occupation of Alta California which began in approximately 1769. This pattern is characterized by settlements indicative of large, dense populations with elaborate trade networks and an intensive hunting, fishing, and gathering subsistence strategy with a continued focus on acorns (Moratto 1984, p. 213; Wolhgemuth and Mears 1994, p. 7). Technologically, the Augustine Pattern is distinguished by the bow and arrow, serrated arrow points, bone awls used in coiled basket making, shaped mortars and pestles, the introduction of clam shell disk beads, drilled Olivella sequin beads, incised bone tubes and abalone ornaments, large amounts of baked clay “globs” (substitutes for rocks used to cook acorn mush in baskets), and emergent pottery (Moratto 1984, p. 211, 213; Rosenthal, et al., 2007, pp. 157–158). Mortuary practices involved either cremation or pre-interment grave-pit and artifact burning coupled with flexed burials. Differential distribution of grave goods, evidence of increased trade, and settlement expansions indicate that the Augustine Pattern was a period of population growth and escalating sociopolitical complexity.

Important archaeological investigations more specific to the region housing the GWF Tracy project areas are summarized by Napton (2006) and Egherman (2001). Excavations in the immediate project area vicinity have been conducted at CA-SJO-165 and CA-SJO-003, with the latter being located within the TL3 segment.

Ethnographic Background[2]

Historians recognize three periods in California: the eighteenth- and nineteenth-century Spanish exploration and settlement, the brief tenure of Mexico, and the subsequent American takeover and annexation. All of the latter periods equate to the ethnographic period for California Native Americans, during which any written records regarding Native Americans, all anthropological writings about Native Americans, and the contributions of Native Americans themselves compose what scholars know, apart from limited archaeological information, about Native American lifeways in California since Euro-American contact.

The GWF Tracy project is located within the traditional territory claimed by the Northern Valley Yokuts. "Yokuts" is a name applied to a large and diverse group of Native Americans inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California in a 40–60-mile-wide stretch along the San Joaquin River south of the Mokelumne River and north of the sharp bend that the river takes to the northeast (Kroeber 1976; Wallace 1978). For the Northern Valley Yokuts, the San Joaquin River and its main tributaries served as a lifeline to the valley, as a source of fish and game, and as an environment favorable to another important food source, the valley oak (*Quercus lobata*). Their trade networks extended into the Monterey Bay region, the North Coast Ranges, and in particular, into the Sierra Nevada Mountains to the east (Wallace 1978) so that a variety of alternate food and material resources were further available to them.

Although available information is limited and often equivocal, ethnographic accounts indicate that as many as 63 groups may have inhabited the territory associated with the Northern Valley Yokuts (Latta 1999). These groups were true tribes, each with a permanent village of some 300 people (Reno 2003, p. 5) and its own chief. Family houses were round or oval, with sunken floors, a conically shaped pole-frame structure, and woven tule-mat coverings. Each village also had a lodge for dances and other community functions, as well as a sweathouse. According to early accounts, the Northern Valley Yokuts traded with neighboring tribes and were fairly peaceful.

The proposed GWF Tracy project is located in proximity to three Northern Valley Yokuts historic villages: *Jusmite*, *Tamcan*, and *Cholbon* (Bennyhoff 1977, pp. 133, 134, 164; Wolhgemuth and Mears 1994, p. 8). *Jusmite* was located just northeast of where the San Joaquin and Old Rivers split and *Tamcan* was located just west of this split. *Cholbon* was most likely located on the south bank of Tom Paine Slough within the vicinity of the current town of Banta. *Cholbon* would, then, have been located just west of the proposed GWF Tracy project reconductoring segments TL2 and TL3.

The villages were built on mounds along river banks to avoid the spring floods which resulted from heavy Sierra snow melts. Seasonal flooding posed one of the few natural threats to this fully sedentary lifestyle (Wolhgemuth and Mears 1994, p. 8). But living beside rivers and streams had many advantages too. The rivers provided plentiful fish, which was the mainstay of the Northern Valley Yokuts diet, including river perch, Sacramento pike, salmon, and sturgeon. The surrounding woodland, grasslands, and

[2] The following discussion was adapted from Egherman 2001, which relied strongly on Wallace 1978.

marshes provided acorns, seeds, and tule roots, and many hunting opportunities, with waterfowl, such as geese and ducks, and animals, such as antelope, elk, and brown bear, abundant in these areas.

Ethnographic studies indicate that the Northern Valley Yokuts used bone harpoon tips for fishing, stone sinkers for nets, chert projectile points for hunting, and mortars, pestles, scrapers, knives, and bone awl tools to process food. Marine shells, traded from coastal tribes, were used for necklaces and other adornments, and marine shell beads sometimes accompanied the dead. They used tule-reed rafts to navigate the waterways for fishing and fowling. They also manufactured intricate baskets for a variety of purposes, including gathering, storing, cooking, eating, winnowing, and transporting food materials. Very little is known of the Northern Valley Yokuts' clothing, but their tattoos served not only as personal decoration but also as a form of individual identification. The Northern Valley Yokuts either cremated their dead or buried them in a flexed position.

For most of the Northern Valley Yokuts, contact with Europeans commenced when Spanish expeditions began to actively explore the Delta and interior Central Valley. Initially, the Coast Ranges served as a barrier against heavy recruitment of Delta inhabitants by the Spanish missions. By the early nineteenth century however, Spanish (and later, Mexican) missionaries pushed into the Delta and interior valley, searching both for fugitive Native American neophytes, who had fled missions, and for fresh converts. The Northern Valley Yokuts resented the intrusion and eventually stole horses and cattle from ranchos and missions in retaliation. Still, they were taken in large numbers to the San Jose, Santa Clara, Soledad, San Juan Batista, and San Antonio missions (Wallace 1978, p. 468). Further decimation of the Northern Valley Yokuts population occurred in the summer of 1833 as the result of a malaria epidemic that swept through the valley (Cook 1955). Their decline continued as the American Period ensued in 1849 with the Gold Rush. Between 1851 and 1852, representatives of three Northern Valley Yokuts groups signed land cession treaties in exchange for large reservations. However, these reservations never materialized, and the treaties were never ratified by the United States Senate (Wallace 1978). Today, people of Northern Valley Yokuts ancestry continue to live throughout the Delta and the Central Valley, some on non-federally recognized rancherias but many within the population at large.

Historic Background

Altamont Pass and a shallow crossing on the San Joaquin River, at present-day Mossdale, have figured importantly in the history of the area in which the proposed GWF Tracy project is located. These natural features have favored the use of the area for transportation. As one of the few good passes over the Coast Range connecting the coastal region south of San Francisco Bay with the Central Valley, the Altamont Pass was doubtless used in prehistory, as well. In the historic period, transportation routes first made use of the crossing and pass, and more recently supply and communication lines have used the pass extensively. Consequently, the proposed GWF Tracy project vicinity is "crisscrossed by roads, railroads, power lines, telegraph lines, telephone lines, underground oil pipelines, and underground [natural] gas pipelines" (Reno 2003, p. 6).

Spanish Period (1769 to 1821)

In California, the historic period starts with the coming of the Spanish and the establishment of the Spanish mission system in 1769. Parties composed of Spanish military and Franciscan friars explored the proposed GWF Tracy project vicinity, but no permanent Spanish settlements were ever established there. This area was, however, part of the vast expanse of range land used by the Spanish, and later the Mexicans, to raise cattle for the hide and tallow trade, a staple source of revenue for the local government (Rice, et al., 1996, pp. 135–137; Reno 2003, p. 6).

Travel into and through the area was most likely via the Old Los Angeles Trail, also known as *El Camino Viejo*. This is the oldest north/south trail to traverse the entire length of the San Joaquin Valley (Hoover, et al., 1990, p. 85). It led from San Pedro to San Antonio (now Oakland). Following a route identical to what later became known as the Stockton-Los Angeles Road, the Old Los Angeles Trail skirted the eastern slope of the Coast Range foothills, finally passing out of the valley through Corral Hollow and Patterson Pass, approximately six miles southwest of modern-day Tracy and two miles southwest of the proposed GWF Tracy project (Hoover, et al., 1990, p. 85). A California State Historical Landmark (#755) placed at Corral Hollow commemorates the trail (Egherman, 2001, p. C-9).

Mexican Period (1821 to 1848)

In 1821, Mexico gained its independence from Spain, and Alta California became one of the provinces of the Republic of Mexico. After the government secularized the missions in 1833, the Mexican governors of Alta California began making large rancho grants of former mission lands to Mexican citizens, particularly to soldiers and members of prominent families who had financed various government initiatives. In the 1840s, the Mexican authorities made a few large rancho grants in the San Joaquin Valley, but very few actual homesteads were established. The Pico and Naglee “El Pescadero” (Spanish for “fishmonger”) grant of 35,546.39 acres was on the Old River, and the town of Tracy, the TPP plant, and the proposed GWF Tracy project’s transmission line segments TL2 and TL3, proposed for reconductoring, are all now located within the old boundaries of this grant (Beck and Haase 1974, Map 28). The grant reportedly received its name from the Northern Valley Yokuts village of *Cholbon*, which the Spanish had named Pescadero based on the observation of the local Native Americans’ proficiency at fishing (Hoover, et al., 1990, p. 349). Antonio M. Pico, the original grantee of the Pico and Naglee grant did not establish permanent occupation there. El Pescadero was patented by the United States on March 10, 1865 (Wolhgemuth and Mears 1994, p. 8).

American Period (1848 to the Present)

Following the conclusion of the Mexican War in 1848, the proposed GWF Tracy project vicinity came under the control of the United States. During that same year gold was discovered at Sutter’s Mill in Coloma, triggering the Gold Rush of 1849. These events inaugurated an era of widespread Euro-American settlement in California and the beginning of commerce in the area around the proposed GWF Tracy project.

Beginning in 1848, John Doak and his partner, Jacob Bonsell, established a ferry across the San Joaquin River near present-day Mossdale (named for the subsequent

owner of the ferry, William S. Moss) to facilitate the Forty-Niners' travel from San Jose and from southern California to Sutter's Fort and the goldfields, commemorated by California Historical Landmark #437 (Hillman and Covello 1985, p. 222; Proudy 1980, p. 59; Napton 2006, p. 14). A ferry operated in this location until 1890, when a bridge put the ferry out of business (Napton 2006, p. 14).

The first bridge across the San Joaquin River was a railroad bridge built near Mossdale in 1869 by the Central Pacific Railroad. The wooden bridge was the linking point for the completion of the last leg of the Transcontinental Railroad, with construction proceeding simultaneously from the Bay Area and Sacramento and meeting at the San Joaquin River in September, 1869 (Wolhgemuth and Mears 1994, p. 9). On November 10, 1869, the first ocean-to-ocean passenger train passed over this bridge (Hillman and Covello 1985, p. 221). An iron-truss structure replaced the wooden bridge in 1895 and served until the present span was completed in 1942. California Historical Landmark #780-7 commemorates the railroad bridge and the completion of the Transcontinental Railroad at this location, about 0.5 mile northeast of the northern end of the proposed GWF Tracy project's TL3 segment, slated for reconductoring.

The community of Banta, located between Mossdale and Tracy, was the site of the Elk Horn Inn, a Gold-Rush stage stop and the "last sign of civilization before crossing the sand plains on the Stockton-San Jose stage road" (Hillman and Covello 1985, p. 111). Expanded in 1853 into a two-story hotel, restaurant, and saloon, the inn burned down in 1868. Banta was also the half-way point on the West Side River Road for freight wagons carrying hay and grain, as well as a railroad terminal for shipping cattle and sheep (Hillman and Covello 1985, p. 111). At its peak in the 1870s, Banta had a hotel, four general stores, two blacksmith shops, a livery stable, five saloons, the Banta and Hill's Ferry Stage Line, and a Wells Fargo agency. Considered the "chief town of the West Side" of the San Joaquin River, its prominence began to fade when the new town of Tracy was platted in 1878 where two Central Pacific Railroad lines intersected (Egherman 2001, p. C-10). The proposed GWF Tracy project's TL2 segment, slated for reconductoring, is located approximately one mile east of Banta, whose rural eastern outskirts abut one of the TL2 towers.

Laid out in a grid by railroad engineers, Tracy was a railroad town from its beginnings. The availability of rail transportation for bulk farm products encouraged the development of agriculture in the region. Agriculture dominated the Tracy area until World War II, when its rail connections made Tracy an ideal location for warehousing defense matériel, resulting in the expansion of the city's boundaries. After the war, Tracy's transportation facilities attracted manufacturing, such as the Owens Illinois Glass Company, which built its plant in 1962, and food processing factories. As the importance of rail transportation declined, the convergence of three interstate highways (I-580, I-5, and I-205) near the town sustained Tracy's economic base as a transportation hub (Egherman 2001, p. C-10).

Agriculture in the region around Tracy began as grazing and dryland grain farming. Often utilizing either planting every other row or fallowing alternate fields every other year, dryland farming required large tracts of land to be successful. Martin Lammers, a local politician, controlled more than 1,400 acres near the proposed GWF Tracy project areas. Late nineteenth-century technological developments in the processing and

preservation of milk and the successful introduction and dryland farming of alfalfa as cattle feed contributed to the development of a large dairy industry in the region (Gross 2002, pp. 8–9), later enhanced by the introduction of irrigated farming. Martin Lammers was the first to undertake irrigated farming in the nineteenth century, but that mode of agriculture did not become prevalent in the region until after the construction of the Delta-Mendota Canal in 1952. Intensive deep plowing accompanied irrigated agriculture, resulting in disturbance of soils to depths of three feet or more in the proposed GWF Tracy project vicinity (Reno 2003, pp. 28–29).

CULTURAL RESOURCES INVENTORY

A project-specific cultural resources inventory is a necessary step in staff's effort to determine whether the proposed project may cause significant impacts to historically significant cultural resources and would therefore, under CEQA, have an adverse effect on the environment.

The development of a cultural resources inventory entails working through a sequence of investigatory phases. Generally the research process proceeds from the known to the unknown. These phases typically involve doing background research to identify known cultural resources, conducting fieldwork to collect requisite primary data on not-yet-identified cultural resources in the vicinity of the proposed project, assessing the results of any geotechnical studies or environmental assessments completed for the proposed project site, and compiling recommendations or determinations of historical significance (see "Determining the Historical Significance of Cultural Resources," below) for any cultural resources that are identified.

This subsection describes the research methods used by the applicant and Energy Commission staff for each phase and provides the results of the research, including literature and records searches (California Historical Resources Information System (CHRIS) and local records), Native American consultation, and field investigations. Staff provides a description of each identified cultural resource, its historical significance (if evaluated), and the basis for its significance evaluation. Assessments of the project's impacts on historically significant cultural resources, potential impacts on previously unidentified, buried archaeological resources, and proposed mitigation measures for all significant impacts are presented in a separate subsection below.

Staff's Area of Analysis

The inventorying of cultural resources within what staff defines as the appropriate area for the analysis of a project's potential impacts is the first step in the assessment of whether the proposed project may cause a significant impact to a CRHR-eligible cultural resource and therefore have an adverse effect on the environment. The area that staff considers when identifying and assessing impacts to historical resources, called the "area of analysis" for the project, is usually defined as the area within and surrounding the project site and associated linear facility corridors. The area varies in extent depending on whether the cultural resource is archaeological, ethnographic, or built-environment:

- For this project, the archaeological area of analysis is defined as the project site footprint, plus a buffer of 200 feet, and the project off-site linear facilities routes, plus 50 feet to either side of these routes;

- For ethnographic resources, the area of analysis is expanded to take into account traditional use areas and traditional cultural properties which may be far-ranging, including views that contribute to the historical significance of the property. These resources are often identified in consultation with Native Americans and other ethnic groups. Because no traditional use areas or traditional cultural properties were identified as a result of consultation with Native Americans (see "Native American Consultation" subsection below), the ethnographic area of analysis for this project is the same as the archaeological area of analysis;
- For this project, proposed for a rural location where the setting of potentially historic resources could be adversely affected by industrial development, the area of analysis for built-environment resources is defined as the project site plus a half-mile buffer out from the project site and from any above-ground linear facilities; and
- For a historic district or a cultural landscape, staff defines the area of analysis based on the particulars of each project. No historic districts or cultural landscapes were identified for the GWF Tracy project.

As used by staff, the term "project areas" means the footprints of the several project components, including the plant site, the laydown area(s), and the several linear facility corridors, plus any new access roads and any borrow and disposal sites.

Determining the Historical Significance of Cultural Resources

CEQA requires the Energy Commission, as a lead agency, to evaluate the historical significance of cultural resources by determining whether they meet several sets of specified criteria. Under CEQA, the definition of a historically significant cultural resource is that it is eligible for listing in the CRHR, and such a cultural resource is referred to as a "historical resource, which is a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR", or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of section 5024.1 (g) of the Public Resources Code," or "any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record" (Cal. Code Regs., tit. 14, § 15064.5(a)). The term, "historical resource," therefore, indicates a cultural resource that is historically significant and eligible for the CRHR.

Consequently, under the CEQA Guidelines, to be historically significant, a cultural resource must meet the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the NRHP. In addition to being at least 50 years old,[3] a resource must meet at least one (and may meet more than one) of the following four criteria (Pub. Resources Code, § 5024.1):

- Criterion 1, is associated with events that have made a significant contribution to the broad patterns of our history;

3 The Office of Historic Preservation's Instructions for Recording Historical Resources (1995) endorses recording and evaluating resources over 45 years of age to accommodate a potential five-year lag in the planning process.

- Criterion 2, is associated with the lives of persons significant in our past;
- Criterion 3, embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values; or
- Criterion 4, has yielded, or may be likely to yield, information important to history or prehistory.

Historical resources must also possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance (Cal. Code Regs., tit. 14, § 4852(c)).

Additionally, cultural resources listed in or formally determined eligible for the National Register of Historical Places (NRHP) and California Registered Historical Landmarks numbered No. 770 and up are automatically listed in the CRHR and are therefore also historical resources (Pub. Resources Code, § 5024.1(d)). Even if a cultural resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows a lead agency to make a determination as to whether it is a historical resource (Pub. Resources Code, § 21084.1).

The assessment of potentially significant impacts to historical resources and the mitigation that may be required of a proposed project to ameliorate any such impacts depend on CRHR-eligibility evaluations.

Literature and Records Searches

CHRIS Records Search

Methods

Clint Helton, CH2MHILL Project Archaeologist and cultural resources consultant to GWF, directed all cultural resources research activities for the proposed GWF Tracy project. On January 15, 2008, he requested staff at the Central California Information Center (CCIC, part of the California Historical Resources Information System, or CHRIS) at California State University, Stanislaus, to conduct a records search to identify all recorded cultural resources located in or within a one-mile radius of the boundaries of the proposed GWF Tracy project site and within a one-mile radius of the TL2 and TL3 reconductoring locations. The CHRIS records search (GWF2008a, p. 5.3-7; confidential app. 5.3C) provided information on:

- Previously recorded prehistoric and historic-period archaeological sites;
- Previously recorded historic built-environment resources;
- Resources listed on the California Register of Historical Resources (CRHR);
- Resources listed on the National Register of Historic Places (NRHP); and
- Previous cultural resources reports pertinent to the project vicinity.

Results

Sent out on January 16, 2008, the CHRIS record search identified 14 previous cultural resources investigations conducted and 10 previously recorded historical resources located within one mile of the project areas. Nine of the resources were in the vicinity of the TPP and one was in the vicinity of the TL2 and TL3 reconductoring locations (GWF2008a, App. 5.3B). (See Cultural Resources Table 2 and Table 3, below, for a list, a description, and the CRHR eligibility of each of these ten resources.)

Local Records Search

Methods

On August 21 and 22, 2008, Mr. Helton telephoned the Tracy Historical and Genealogical Society, the San Joaquin County Historical Society and Museum, and the San Joaquin County Planning Department, inquiring about locally recognized cultural resources.

Results

Mr. Helton learned that none of these sources maintains a list of locally recognized cultural resources, and so identified no additional cultural resources (CH2M2008c, pp. 12–13).

Previous Cultural Resources Studies

The CHRIS records search identified reports from 14 prior cultural resources studies covering parts of the area within a one-mile radius of the proposed GWF Tracy project. The previous studies dated from 1990 to 2003 and were conducted for various proposed development projects in the vicinity of GWF Tracy. The previous reports that are most relevant to the proposed GWF Tracy are the two associated with the certification and construction of the TPP, Egherman 2001 and Reno 2003, discussed below. These two studies documented 12 previously known and newly discovered cultural resources, of which 2, both built-environment resources (the SP railroad and its associated telegraph/telephone/ power line), were evaluated as potentially CRHR-eligible.

Egherman 2001 Methods

Egherman 2001 was the report of the cultural resources survey of the TPP project areas conducted for the submission to the Energy Commission of the TPP AFC. The methods employed to identify cultural resources were typical: CHRIS records search to identify known cultural resources, historical research on known built-environment resources, and pedestrian survey of the project areas to identify previously unknown cultural resources.

Egherman 2001 Results

Ms. Egherman identified 10 potential historical resources, including both previously known and newly recorded resources, in the vicinity of the TPP and its linear facilities. Some of these were also later discussed and evaluated by Mr. Reno (Egherman 2001, pp. C-23–C-32; Table C-3; Reno 2003, pp. 15–30).

CA-SJO-00262

This previously known prehistoric archaeological resource was an isolated cache of milling artifacts located on the bank of a shallow creek, including a sandstone metate fragment, a mano fragment, and an abrading stone. They could not be dated. The location has been disturbed by long term agricultural activities, so the recorder thought it unlikely that the artifacts were indicative of subsurface materials or an archaeological site.

39-000039/SJO-I-24

This previously known prehistoric isolated artifact was a fragment of a baked clay ball, which could not be dated. Isolated finds almost always lack information values that would make them eligible for the CRHR, so although its recorder did not make a recommendation on the CRHR eligibility of this isolated find, staff recommends it as not eligible.

39-000089

This previously known historic built-environment resource is the Delta-Mendota Canal, dating from 1952 to the present. The canal was constructed between 1946 and 1952 to transfer water from the Sacramento River for irrigation in the San Joaquin Valley. The canal was recommended as eligible for listing on the NRHP under Criteria A and C, at a state level of significance, for the period 1946–1952, making it also eligible for the CRHR under Criteria 1 and 3.

39-000090

This previously known historic built-environment resource is the California Aqueduct, dating from 1967 (portion near the TPP) to the present. It has not yet reached an age where it can be considered potentially eligible for the CRHR.

39-000098

This previously known historic built-environment resource is the Western Pacific/Union Pacific Railroad (WP). It was built *circa* 1900 and was acquired by the Union Pacific Railroad in 1980. It was recommended as not eligible for the NRHP due to lack of integrity, but has not been formally evaluated for the CRHR.

CA-SJO-00250H

This previously known historic built-environment resource is the Western Pacific/Central Pacific/Southern Pacific Railroad (SP), dating from 1870 to1985. This line was the first connection between Sacramento and San Francisco, routed through Altamont Pass, that completed the Transcontinental Railroad. The segment of this railroad that forms the northern boundary of the TPP plant site parcel is part of a longer line that was removed from through-service in 1985. Although Ms. Egherman recommended it as ineligible for the CRHR due to its lack of integrity, Mr. Reno more recently recommended this segment of the railroad as eligible for listing in the CRHR under Criterion 3 for an unusual construction feature—stone retaining walls for grade ballast, thought to pre-date 1920.

39-004287

This historic built-environment resource, identified during Ms. Egherman's survey, is a fence line, associated with the SP, dating from 1869 to 1923. This resource parallels the north side of the SP right-of-way and has been identified as a feature of the railroad. The fence line is no longer continuous, with most of it missing and other parts present but no longer standing in 2003. Based on the presence of both cut and wire nails and the type of barbed wire used in at least portions of the fence, it was dated to the first period of the railroad, 1869–1923. Due to poor integrity, this resource was recommended as not eligible for listing on the CRHR.

39-004288

This historic built-environment resource, identified during Ms. Egherman's survey, is a telegraph/telephone/power line associated with the SP, dating from 1870. When it was abandoned is not known. This resource consists of a mile-long segment of a relict telegraph, telephone, and power line that runs parallel to the SP on its the south side from Lammers Ferry Road to the boundary between sections 35 and 36. This resource is on the northern boundary of the TPP parcel. Part of the telegraph line was built in 1869, and the rest of the line was built after 1919 and into the 1930s. With its conductors missing, Ms. Egherman reported it to be in poor condition, and she did not make a recommendation on the CRHR eligibility of this resource. But Mr. Reno more recently recommended it as potentially eligible for listing on the CRHR under Criterion 3 for representing railroad technology of the 1869–1923 period and under Criterion 4 for its assemblage of hardware and equipment that could provide data important in the history of technology.

39-004289

This historic built-environment resource, identified during Ms. Egherman's survey, consists of three pairs of transmission line structures (six structures total) supporting three parallel-running lines: one pair of steel lattice towers from the 115-kV Tesla-Kasson transmission line (known since 1965 as Stanislaus-Newark Circuit # 1), dating from 1908 to the present; one pair of steel lattice towers from the 115-kV Tesla-Manteca transmission line (known since 1965 as Stanislaus-Newark Circuit # 2), dating from 1910 to the present; and one pair of wooden monopoles from the Tesla-Stockton 115-kV line, which post-dates 1981. The two pairs of Stanislaus-Newark Circuit support structures are part of a 137-mile-long transmission system that extends from the Stanislaus Power House to San Francisco. Historical research in PG&E's records led the historic preservation specialists who evaluated Stanislaus-Newark Circuits #1 and #2 to recommend them as not eligible for the CRHR since they made no contributions to the broad patterns of our history (Criterion 1), were not associated with any historically important persons (Criterion 2), and lack engineering distinctions, innovations, or evidence of the work of a master designer (Criterion 3). Additionally, the historical research indicated that Stanislaus-Newark Circuits #1 and #2 have a long history of maintenance and modifications, and consequently, they lack integrity of design, materials, and workmanship. The system's CRHR non-eligibility was assumed to apply to resource 39-004289 as well (DPR2001).

39-004291

This historic built-environment resource, identified during Ms. Egherman's survey, is an abandoned house that appeared to the surveyors to be older than 50 years. Part of an agricultural complex on Hansen Road northwest of the TPP, the two-story house had a corrugated metal roof whose shape was not reported. The windows were boarded over, and the house was described as in poor condition. Because a TPP project description change resulted in this house being beyond project impacts, Ms. Egherman made no recommendations on its CHRH eligibility.

Reno 2003 Methods

Reno 2003 was the final report of the cultural resources monitoring conducted in connection with the construction of the TPP, during the period from July 29, 2002, through May 7, 2003. The methods for identifying cultural resources encountered during construction included observation of exposed soils during all project excavations and historical research on discovered resources to facilitate CRHR eligibility recommendations.

Reno 2003 Results

As a result of monitoring, Mr. Reno identified two additional archaeological resources. One (39-004388) was found during the excavation of the TPP waterline and consisted of two isolated finds, a green, beehive-shaped insulator (commonly used from 1884 through the mid-twentieth century) and a crown-capped, long-neck beer bottle (dating after 1930). Isolated finds almost always lack information values that would make them eligible for the CRHR, so Mr. Reno recommended these isolated finds as not eligible (Reno 2003, p. 30).

The other additional resource (CA-SJO-00285H) was found during the construction of the TPP's main access road. It consisted of the subsurface remains (postmolds) of an overhead utility line and a fence line, with a collection of possibly associated artifacts recovered from the plow zone soils overlying the postmolds. The artifacts included fragments of aqua and amethyst glass, a glue bottle, a cut nail, and part of a hay rake tine. Mr. Reno thought the site was associated with dry farming up to 1952 and irrigated farming thereafter. Due to its lack of integrity and low density, Mr. Reno did not recommend this resource as CRHR eligible (Reno 2003, pp. 27–28).

Mr. Reno also contributed additional field and historical data regarding the SP railroad segment north of the TPP parcel boundary and the associated telegraph/telephone/ power line. The new information led him to conclude that both these resources were potentially eligible for the CRHR, based on CRHR Criterion 3 for the railroad and Criteria 3 and 4 for the associated telegraph/telephone/ power line (Reno 2003, pp. 22, 26).

Previous Windshield or Intensive Built-Environment Surveys

None of the previous surveys was specific to built-environment resources, but the two most pertinent, discussed just above, addressed both archaeological and built-environment resources.

Native American Consultation

Methods

On January 15, 2008, GWF Energy's cultural resources consultant asked the Native American Heritage Commission (NAHC) to search its Sacred Lands File for any Native American traditional cultural properties, and for a list of Native Americans who had heritage ties to the project area and wanted to be informed about new development projects there. The NAHC responded on January 16, 2008, indicating a negative return from the search of their Sacred Lands File and providing contact information for seven Native American individuals/groups, most of them Miwok, with one person representing, additionally the Northern Valley Yokuts and Ohlone/Costanoans. CH2M Hill sent certified letters on January 17, 2008, to these persons, describing the proposed GWF Tracy project and requesting information on known cultural resources that could be affected by the project (GWF2008a, App. 5.3A).

Results

The NAHC responded to the consultant on January 16, 2008, indicating a negative return from the search of their Sacred Lands File, that is, they identified no known traditional cultural properties in the vicinity of the proposed project. As of March 7, 2008, one response to the letters requesting information on known cultural resources, sent by the consultant to Native Americans, had been received. Ms. Silvia Burley, representing the California Valley Miwok Tribe, sent a letter, dated January 21, 2008, stating that she had no concerns about cultural resources in the vicinity of the proposed project, but requested to be informed if any Native American artifacts are found (GWF2008a, App. 5.3A).

Field Investigations

Archaeological Survey

As discussed above, an archaeological survey was previously conducted for the TPP (Egherman 2001). Because the proposed GWF Tracy project would be constructed entirely within the TPP plant site, and because the surface soils of the TPP plant site were wholly disturbed by the TPP grading, excavation, and application of fill, no additional pedestrian archaeological survey was necessary for the main components of the GWF Tracy project (GWF2008a, p. 5.3-6). The two transmission line segments (TL2 and TL3) that the GWF Tracy project proposes to reconductor, however, had not been previously surveyed for cultural resources, so these locations were surveyed in support of the present AFC.

Methods

The presence of newly planted agricultural fields under some portions of the three segments of transmission line proposed for reconductoring impeded 100% pedestrian archaeological survey, with transects at 15-meter intervals, which was the method employed where possible. Where not possible, opportunistic examination of exposed soils was employed (CH2M2008c).

Results

No historic or prehistoric archaeological resources were observed during the survey of the reconductoring locations (GWF2008a, p. 5.3-10).

GWF's Geoarchaeological Investigations

GWF did not conduct a geoarchaeological study of the proposed project site, and staff considered requesting that they do so, to provide staff with objective data on which to base an assessment of the likelihood of the presence, at depths greater than three feet, of buried archaeological deposits at the project site. After a review of the AFC sections on geology, paleontology, and soils, and the final reports of the TPP paleontological and cultural resources monitoring programs (Reno 2003, pp. 11–15), staff was satisfied that sufficient information on the project site's subsurface soils was available on which to base the necessary assessment of the likelihood of buried archaeological deposits. Consequently, staff did not ask for a geoarchaeological study of the GWF Tracy project site.

Windshield or Intensive Built-Environment Survey

GWF Energy's cultural resources consultant conducted no specific built-environment survey for the proposed GWF Tracy project because the previous TPP cultural resources survey had identified built-environment resources in the vicinity of the GWF Tracy plant site, and because TL2 and TL3 reconductoring would be done on existing transmission lines dating to 1974, so the lines themselves were not of sufficient age to be considered potential historical resources (CH2M2008c), nor would the setting of older built-environment resources near the reconductoring locations be affected since the transmission lines are already present.

Summary of CRHR-Eligible Archaeological Resources

All of the four prehistoric and historic-period archaeological resources (39-000039/SJO-I-24, CA-SJO-00262, CA-SJO-00285H, and 39-004388, discussed above) located within one mile of the proposed GWF Tracy project were previously known resources compiled in connection with the certification and construction of the TPP. None was recommended as CRHR eligible, and none would be impacted by the proposed GWF Tracy project.

Summary of CRHR-Eligible Ethnographic Resources

Unless further communications with Native Americans disclose sites of concern, at this time no CRHR-eligible ethnographic sites have been identified that could be impacted by the construction of the proposed GWF Tracy project.

Summary of CRHR-Eligible Built-Environment Resources

Of the eight built-environment resources located within one mile of the proposed GWF Tracy project (listed in Cultural Resources Table 3 and discussed above), all were previously known resources compiled in connection with the certification and construction of the TPP. Three of them, the SP railroad (CA-SJO-250H), its associated telegraph, telephone and power line (39-004288), and the Delta-Mendota Canal (39-000089), were recommended as CRHR eligible or potentially eligible. None of the eight resources would be impacted by the proposed GWF Tracy project.

Cultural Resources Table 3
Identified Built-Environment Resources Located
On or Within One Mile of the Proposed GWF Tracy Project

Resource Designation	Type of Resource	CRHR Eligibility	GWF Tracy Project Impact
CA-SJO-250H	Southern Pacific Railroad	Potentially eligible	None
39-000089	Delta-Mendota Canal	Eligible	None
39-000090	California Aqueduct	Not eligible	None
39-000098	Western Pacific Railroad	Not eligible	None
39-004287	SP fence line	Not eligible	None
39-004288	SP telegraph, telephone and power line	Potentially eligible	None
39-004289	Six transmission line support structures	Not eligible	None
39-004291	Farm house	Not evaluated	None

Summary of CRHR-Eligible Cultural Resources Subject to Project Impacts

Background research and field work did not identify any CRHR-eligible cultural resources on or near the proposed GWF Tracy project areas that could be significantly impacted by project-related ground disturbance, construction, or operation.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Method and Threshold for Determining Significance of Impacts to Historical Resources

Under CEQA, "a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" (Pub. Resources Code, § 21084.1). Thus, staff analyzes whether a proposed project would cause a substantial adverse change in the significance, that is, the CRHR eligibility, of all historical resources identified in the Cultural Resources Inventory as CRHR eligible. The degree of significance of an impact depends on:

- The cultural resource impacted;
- The nature of the resource's historical significance;
- How the resource's historical significance is manifested physically and perceptually;

- Appraisals of those aspects of the resource's integrity that figure importantly in the manifestation of the resource's historical significance; and
- How much the impact would change those integrity appraisals.

DIRECT/INDIRECT IMPACTS AND MITIGATION

In the abstract, direct impacts to cultural resources are those associated with project development, construction, and co-existence. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic built-environment resources when those structures must be removed to make way for new structures or when the vibrations of construction impair the stability of historic structures nearby. New structures can have direct impacts on historic structures when the new structures are stylistically incompatible with their neighbors and the setting, and when the new structures produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

Generally speaking, indirect impacts to archaeological resources are those which may result from changed circumstances that result from project activities, such as increased erosion due to site clearance and preparation, or inadvertent damage or outright vandalism to exposed cultural resources due to improved accessibility. Similarly, historic structures can suffer indirect impacts when project construction causes obsolescence and demolition or creates improved accessibility with consequent vandalism and/or greater weather exposure.

Ground disturbance accompanying construction at a proposed plant site, along proposed linear facilities, and at a proposed laydown area has the potential to directly impact archaeological resources, unidentified at this time. The potential direct, physical impacts of the proposed construction on unknown archaeological resources are commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. Placing the proposed plant into this particular setting could have a direct impact on the integrity of association, setting, and feeling of nearby standing historic structures.

Construction Impacts and Mitigation

Direct Impacts

Because no known CRHR-eligible cultural resources were identified in or near the GWF Tracy project areas, the proposed project's construction-related or operation-related impacts on known CRHR-eligible cultural resources would be none.

But ground disturbance for foundations and trenches in previously undisturbed native soils could potentially impact buried CRHR-eligible archaeological resources for which no surface evidence was observable. For the GWF Tracy project, the potential presence of such resources would be of concern only where proposed project-related ground disturbance would affect undisturbed native soils below three feet from the surface—the presumed depth of disturbance associated with previous agricultural use.

GWF has provided documentation that the soils in the developed part of the TPP site were disturbed to a depth of at least four feet (GWF2008a, p. 5.8-8) during the construction of the existing plant, and in some parts of the site to considerably greater depths: the duct bank depth reached 12 feet; and the power block and the stormwater retention pond depths both reached eight feet (Reno 2003, pp. 11–15). Additionally, no buried archaeological resources were discovered by the archaeological monitor during the construction-related ground disturbance in the developed part of the TPP site (Reno 2003). Based on these considerations, GWF has stated that it does not expect buried archaeological deposits to be found during the construction-related ground disturbance for the proposed GWF Tracy project at the TPP site (CH2M2008f, Data Response 25).

Staff agrees with this expectation, with the exception of two TPP areas where GWF Tracy project-related ground disturbance would take place in soils previously undisturbed below three feet in depth. These two areas are the location of the new stormwater retention basin and the location of the six new, tubular steel poles proposed for the loop-through interconnection from the plant's switchyard to the Tesla-Manteca 115-kV transmission line. The new stormwater retention basin would be excavated to an estimated 10 feet below grade in a part of the TPP parcel that appears to be undisturbed except by the probable agricultural use that preceded the TPP (CH2M2008f, Data Response 22; GWF2008a, fig. 1.1-4), which is presumed to extend to no more than three feet below the surface. The six new gen-tie poles, proposed to be 40–50 feet tall (GWF2008a, p. 3-3), would require the excavation of deep holes (depth not provided by GWF) into similarly undisturbed soils (GWF2008a, fig. 3.1-1).

With respect to potential ground disturbance associated with the reconductoring of the three off-site segments of existing transmission line, GWF's cultural resources consultant, Mr. Helton, stated that no new transmission line poles, no replacement transmission line poles, and no excavations were planned in conjunction with the reconductoring (CH2M2008c). While this covers the potential ground disturbance associated with foundations for new structures, other types of ground disturbance commonly associated with reconductoring were not addressed. These include temporary access ("spur") roads to each existing towers and heavy equipment maneuvering at multiple pull sites along the segments being reconductored. These activities would have the potential to impact surface and shallowly buried archaeological resources if the reconductoring segments were located in areas whose surface soils were previously undisturbed, but that is not the case here. Previous agricultural use has disturbed the soils in the reconductoring locations to a depth of at least three feet, and the proposed project's access roads and pull-site maneuvering would not be expected to cause ground disturbance to that depth.

Staff thus concludes that the proposed GWF Tracy project has the potential to impact possibly CRHR-eligible buried archaeological resources in two previously undeveloped locations where deep excavations for the new stormwater retention basin and the new, tubular steel gen-tie poles have been proposed.

GWF has acknowledged that buried archaeological deposits could be encountered during project-related ground disturbance, and has consequently proposed the following contingency mitigation measures (GWF2008a, pp. 5.3-12–5.3-13):

1. GWF will retain a qualified Cultural Resources Specialist (CRS) to prepare a cultural resources monitoring and mitigation plan and to develop a program to train construction personnel to identify cultural resources and to halt work if cultural resources are encountered during construction.

2. The CRS, or a qualified monitor, will be available to inspect and evaluate any finds of buried archaeological resources made during construction and, if archaeological remains are discovered, will evaluate them and make a recommendation on their CRHR-eligibility and the need for any mitigation to the Energy Commission's Compliance Project Manager.

3. If cultural resources are discovered during construction, work will be halted in the immediate vicinity of the find, and the cultural resources monitor or CRS will delineate the area within which construction will remain halted until the CRS, in consultation with the CPM, inspects and evaluates the find.

4. The CRS will follow accepted professional standards in recording any find and will submit the standard Form DPR 523 to the CHRIS.

5. If the CRS determines that the find is not CRHR eligible, and the CPM concurs, construction will proceed without further delay. If the CRS determines that further information is needed to determine whether the find is CRHR-eligible, the CRS will, in consultation with the CPM, prepare a plan and a timetable for evaluating the find.

6. If the CRS and CPM determine that the find is CRHR eligible, the CRS will prepare and carry out a mitigation plan to recover data to address archaeological research questions, which will be considered an effective mitigation measure for damage to or destruction of the deposit. The mitigation program will be carried out as soon as possible to avoid construction delays.

7. Construction will resume at the site as soon as the field data collection phase of data recovery is completed. The CRS will verify the completion of field data collection by letter to the project owner and the CPM so that the project owner and the CPM can authorize resuming construction.

8. The CRS will arrange for curation at a qualified facility of records made and archaeological materials collected during any archaeological data recovery program.

9. The CRS will prepare a detailed report summarizing results of the data recovery excavations. This report will be submitted to the curation facility with the collection.

To GWF's suggested contingency mitigation measures, staff has added measures or expanded upon GWF's suggestions to ensure that all significant impacts to CRHR-eligible cultural resources discovered during construction are mitigated to below the level of significance. GWF's suggested mitigation measures and staff's additional

recommendations are incorporated into staff's proposed Conditions of Certification **CUL-1** through **CUL-7**, below. Staff's proposed conditions for identifying, evaluating, and possibly mitigating impacts to previously unknown archaeological resources discovered during construction include having an archaeologist monitor excavation activities in excess of three feet in the location of the new stormwater retention basin and in the location of the six new, tubular steel poles proposed for the loop-through interconnection from the plant's switchyard to the Tesla-Manteca 115-kV transmission line, and having a Native American monitor construction activities if prehistoric cultural resources are found. These conditions would ensure that significant impacts to CRHR-eligible archaeological discoveries discovered during construction would be mitigated to a less-than-significant level.

Indirect Impacts

Neither GWF nor staff identified any indirect impacts to any identified cultural resources in the project areas of the proposed GWF Tracy project, and so no mitigation measures for indirect impacts would be required for any class of cultural resources.

Operation Impacts and Mitigation

During operation of the proposed project, if a leak should develop in the gas or water pipelines supplying the plant, repair of the buried utility could require extensive excavation. So such repairs could impact previously unknown subsurface archaeological resources in areas unaffected by the original trench excavation. The measures proposed for mitigating impacts to previously unknown archaeological resources during the construction of the plant and linear facilities (see "Proposed Conditions of Certification," **CUL-1** through **CUL-7**, below) would also serve to mitigate impacts from repairs occurring during operation of the plant.

Cumulative Impacts and Mitigation

A cumulative impact refers to a proposed project's incremental effects considered over time and together with those of other, nearby, past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Pub. Resources Code sec. 21083; Cal. Code Regs., tit. 14, secs. 15064(h), 15065(a)(3), 15130, and 15355). Cumulative impacts to cultural resources in the GWF Tracy project vicinity could occur if any other existing or proposed projects, in conjunction with the proposed GWF Tracy, had or would have impacts on cultural resources that, considered together, would be significant. The previous ground disturbance from prior projects and the ground disturbance related to the future construction of the GWF Tracy and other proposed projects in the vicinity could have a cumulatively considerable effect on subsurface archaeological deposits, both prehistoric and historic. The alteration of the local setting which could be caused by the construction and operation of the proposed GWF Tracy and other proposed projects in the vicinity could be cumulatively considerable, but may or may not be a significant impact to cultural resources.

GWF's land use consultant in early 2008 identified three projects proposed to San Joaquin County that are located from 2–6 miles from the proposed GWF Tracy, encompassing more than 5,000 acres (GWF2008a, Table 5.6-6). Additionally, six projects that are proposed to the City of Tracy are located 1–3 miles from GWF Tracy,

encompassing over 8,443 acres (GWF2008a, Table 5.6-6). These projects were in various stages of completion, with some under construction and some merely proposed. Staff has not seen assessments of the impacts to cultural resources from these projects, but assumes that each has proposed and would implement cultural resources mitigation measures, as required by CEQA, that would reduce any significant impacts to CRHR-eligible cultural resources to a less-than-significant level.

Staff has proposed conditions of certification for the GWF Tracy project that provide for the identification, evaluation, and avoidance or mitigation of impacts to previously unknown CRHR-eligible archaeological resources discovered during the construction of the project. Proponents of future projects in the vicinity of the GWF Tracy project could mitigate impacts to as-yet-undiscovered subsurface archaeological sites to less-than-significant levels by requiring construction monitoring, evaluation of resources discovered during monitoring, and avoidance or data recovery for resources evaluated as CRHR-eligible. Impacts to human remains can be mitigated by following the protocols established by state law in Public Resources Code, section 5097.98.

Since any significant impacts from the proposed GWF Tracy project to CRHR-eligible cultural resources would be mitigated to a less-than-significant level by the project's compliance with proposed Conditions of Certification **CUL-1** through **CUL-7**, and since similar protocols can be applied to other projects in the area, staff does not expect any incremental effects on cultural resources of the proposed GWF Tracy project to be cumulatively considerable when viewed in conjunction with other projects.

COMPLIANCE WITH LORS

If staff's proposed conditions of certification (below) are properly implemented, the proposed GWF Tracy project would have a less-than-significant impact on any new CRHR-eligible archaeological resources discovered during construction. The proposed GWF Tracy project would therefore be in compliance with applicable state laws, ordinances, regulations, and standards listed in Table 1. Similarly, the project would be in compliance with San Joaquin County's General Plan, which requires CEQA review of project impacts to cultural resources within the county, and in compliance with the City of Tracy's Municipal Code encouragement of preservation of historic and cultural resources.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No agency or public comments on the cultural resources analysis for the GWF Tracy project were received.

CONCLUSIONS AND RECOMMENDATIONS

Staff's has determined that the proposed GWF Tracy project would have no impact on known CRHR-eligible archaeological resources, historic built-environment resources, ethnographic resources, historic districts, or cultural landscapes.

To facilitate the identification and assessment of previously unidentified archaeological resources encountered during construction in previously undisturbed areas and to mitigate any significant impacts from the project on any newly found resources assessed as CRHR eligible, staff recommends that the Commission adopt the following cultural resources Conditions of Certification, **CUL-1** through **CUL-7**. These conditions provide for the hiring of a Cultural Resources Specialist and archaeological monitors, for cultural resources awareness training for construction workers, for the archaeological and Native American monitoring of ground-disturbing activities, for the recovery of data from CRHR-eligible discovered archaeological deposits, for the writing of a technical archaeological report on all archaeological activities and findings, and for the curation of recovered artifacts and other data. When properly implemented and enforced, staff believes that these conditions of certification would reduce to less than significant any impacts to previously unidentified cultural resources encountered during construction or operation. Additionally, with the adoption and implementation of these conditions, the proposed GWF Tracy project would be in conformity with all applicable laws, ordinances, regulations, and standards.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance (includes "preconstruction site mobilization;" "construction ground disturbance;" and "construction grading, boring, and trenching," as defined in the General Conditions for this project), the project owner shall obtain the services of a Cultural Resources Specialist (CRS), and one or more alternate CRSs, if alternates are needed. The CRS shall manage all consultation, monitoring, mitigation, curation, and reporting activities required in accordance with the Conditions of Certification (Conditions). 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 makes recommendations regarding the eligibility to the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ground disturbance shall occur prior to CPM approval of the CRS, unless specifically approved by the CPM. Approval of a CRS may be denied or revoked for non-compliance on this or other projects.

CULTURAL RESOURCES SPECIALIST

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and background conform to the U.S. Secretary of Interior Guidelines, as published in the Code of Federal Regulations, 36 CFR Part 61. In addition, the CRS shall have the following qualifications:

1. The CRS's qualifications 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 historical, as appropriate (per nature of predominant cultural resources on the project site), resources mitigation and field experience in California; and

3. At least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

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.

CULTURAL RESOURCES MONITORS

CRMs shall have the following qualifications:

1. A BS or BA degree in anthropology, archaeology, historical archaeology or a related field and one year experience monitoring in California; or

2. An AS or AA degree in anthropology, archaeology, historical 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, historical 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., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

Verification:

1. At least 45 days prior to the start of ground disturbance, the project owner shall submit the resume for the CRS, and alternate(s), if desired, to the CPM for review and approval.

2. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the approved new CRS the AFC and all cultural documents, field notes, photographs, and other cultural materials generated by the project. If there is no alternate CRS in place to conduct the duties of the CRS, a previously approved monitor may serve in place of a CRS so that construction may continue up

to a maximum of three days without a CRS. If cultural resources are discovered, then construction will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

3. 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.

4. At least 5 days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide additional letters to the CPM identifying the CRMs and attesting to their qualifications.

5. 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.

6. 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.

CUL-2 Prior to the start of ground disturbance, if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, and confidential cultural resources reports for the project. The project owner shall also 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 cultural features or materials. 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. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless specifically approved by the CPM.

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 notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification:

1. At least 40 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, and confidential cultural resource documents to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The

CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

2. At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.

3. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.

4. Weekly, during ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, email, or fax.

5. Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

CUL-3 Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, to the CPM for review and approval. The CPM shall provide the project owner with a draft model CRMMP to adapt for project use. The author's name shall appear on the title page of the CRMMP. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless specifically approved by the CPM.

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

1. The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The Conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the Conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

2. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the local prehistory and history of the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design shall specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. A mitigation plan shall be prepared for any CRHR-eligible resource (as determined by the CPM),

3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground disturbance and post-ground–disturbance analysis phases of the project.

4. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

5. A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

6. A description of all impact avoidance measures (such as flagging or fencing), to prohibit or otherwise restrict access to sensitive resource areas that may be found during construction and/or operation and may subsequently need to be avoided, and identification of the areas where these measures are to be implemented. The description shall address how these measures would be implemented and how long they would be needed to protect the resources from project-related effects.

7. A statement that all cultural resources encountered shall be recorded on a Department of Parks and Recreation (DPR) Form 523 and mapped and photographed. In addition, all archaeological materials collected as a result of the archaeological investigations (survey, testing, and data recovery) shall be curated in accordance with the State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, into a retrievable storage collection in a public repository or museum.

8. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

9. A statement that the CRS has access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resources materials that are encountered during ground disturbance and that cannot be treated prescriptively.

10. A description of the contents and format of the Cultural Resource Report (CRR), which shall be prepared according to ARMR Guidelines.

Verification:

1. Upon approval of the CRS proposed by the project owner, the CPM will provide to the CRS an electronic copy of the draft model CRMMP.

2. At least 30 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.

3. At least 30 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-4 The project owner shall submit the Cultural Resources Report (CRR) to the CPM for approval. The CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The CRR shall report on all field activities related to the implementation of the CRMMP, including dates, times and locations, findings, samplings, and analyses. All survey reports, Department of Parks and Recreation (DPR) 523 forms, and any 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.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

2. Within 90 days after completion of ground disturbance (including landscaping), if cultural materials requiring curation were collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, to accept cultural materials from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

3. Within 10 days after CPM approval of the CRR, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Chairperson(s) of any Native American groups requesting copies of project-related reports.

4. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

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 at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance, including landscaping, is completed. 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. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt construction in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
6. 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;
7. An informational brochure that identifies reporting procedures in the event of a discovery;
8. An acknowledgement form signed by each worker indicating that they have received the training; and
9. 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 such activities are specifically approved by the CPM.

Verification:

1. At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.

2. At least 15 days prior to the beginning of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

3. Monthly, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms 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 ensure that the CRS, alternate CRS, or CRMs monitor full time all ground disturbance deeper than three feet associated with the excavation of the new stormwater retention pond and excavation of the foundation holes for the new support structures for the transmission lines connecting the project's switchyard to the Tesla-Manteca 115-kV transmission line, to ensure there are no impacts to undiscovered archaeological resources.

If, during other ground disturbance at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas, any buried archaeological materials, as defined in the CRMMP, are discovered, the discovery shall immediately be reported to the construction supervisor, who shall halt or redirect ground disturbance in an area around the discovery sufficiently large to ensure that the resource is protected from further impacts, and who shall notify the project owner of the discovery. The project owner shall notify the CRS and the CPM. The CRS shall treat the discovery as provided in **CUL-7**.

Once a discovery of buried archaeological materials has been made, the CRS shall recommend to the CPM, with justifications, whether or not routine archaeological monitoring of ground disturbance should be initiated and where the routine monitoring should be conducted. If the CRS recommends monitoring, and the CPM approves it, the project owner shall ensure that the CRS, alternate CRS, or CRMs monitor full time all ground disturbance in the locations identified by the CRS, to ensure there are no impacts to undiscovered archaeological resources.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of all ground-disturbing activities in the locations identified by the CRS for as long as the activities are ongoing. Where excavation equipment is actively removing dirt and hauling the excavated material farther than fifty feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no further than fifty feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered. On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

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.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

A Native American monitor shall be obtained to monitor ground disturbance along with the CRS, the alternate CRS, or the CRMs in areas where Native American artifacts were discovered. Contact lists of interested 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 shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.

Verification:

1. At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.

2. Monthly, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.

3. At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.

4. Daily, as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail or in some other form acceptable to the CPM.

5. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

6. No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the Chairpersons of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.

7. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

CUL-7 Prior to the start of ground disturbance, to provide for the possibility that a cultural resources discovery could be made while CRS-recommended and CPM-approved monitoring is on-going, the project owner shall grant authority to halt project-related ground disturbance to the CRS, alternate CRS, and the CRMs. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event cultural resources over 50 years of age or, if younger, determined exceptionally significant by the CPM, are found, or impacts to such resources can be anticipated, ground disturbance shall be halted or redirected in an area around the discovery sufficiently large to ensure that the resource is protected from further impacts. CRS-recommended monitoring and daily reporting, as provided in **CUL-6,** shall continue during the project's ground-

disturbing activities elsewhere. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery, and 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), informed of the action taken (i.e., work stoppage or redirection), provided a recommendation of CRHR eligibility, and provided recommendations for mitigation of any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.

2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.

3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.

4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Verification:

1. 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 project-related ground disturbance in the vicinity of a cultural resources 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.

2. Within 48 hours of the discovery of an archaeological or ethnographic resource, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery.

3. Unless the find can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

CULTURAL RESOURCES ACRONYM GLOSSARY

AFC	Application for Certification of a proposed power plant to the Energy Commission
ARMR	Archaeological Resource Management Report
BC	Before the Birth of Christ
AD	After the Birth of Christ
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
CCIC	Central California Information Center, part of the CHRIS
Conditions	Conditions of Certification
CRHR	California Register of Historical Resources
CRM	Cultural Resources Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
DPR 523	Department of Parks and Recreation cultural resource inventory form
FSA	Final Staff Assessment
GWF	GWF Energy LLC
GWF Tracy	GWF Tracy Combined-Cycle Power Plant
LORS	laws, ordinances, regulations, and standards
MCR	Monthly Compliance Report
MLD	Most Likely Descendent
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
PSA	Preliminary Staff Assessment
SHPO	State Historic Preservation Officer

SPPE Small Power Plant Exemption, petition to Energy Commission for exemption from AFC process

Staff Energy Commission cultural resources technical staff

WEAP Worker Environmental Awareness Program

REFERENCES

The tn: 00000 in a reference below indicates the transaction number under which the item is catalogued in the Energy Commission's Docket Unit. The transaction number allows for quicker location and retrieval of individual items docketed for a case or used for ease of reference and retrieval of exhibits cited in briefs and used at Evidentiary Hearings.

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HAZARDOUS MATERIALS MANAGEMENT

Testimony of Alvin J. Greenberg, Ph.D. and Rick Tyler

SUMMARY OF CONCLUSIONS

Staff's evaluation of the proposed GWF Tracy Combined Cycle Power Plant (GWF Tracy), along with staff's proposed mitigation measures, indicates that hazardous materials use at the site would not present a significant impact to the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations, and standards. In response to Health and Safety Code, section 255000 et seq., GWF Energy LLC (the applicant) would be required to update the Hazardous Materials Business Plan (HMBP) currently in place for the Tracy Peaker Project (TPP). The existing Risk Management Plan (RMP) will not require revision or updating. To ensure the adequacy of this plan, staff's proposed conditions of certification require that the HMBP be submitted for concurrent review by the San Joaquin County Environmental Health Department, the Tracy Fire department, and Energy Commission staff. In addition, staff's proposed conditions of certification require that the project prepare and submit to staff a Safety Management Plan for review and approval prior to delivery of any liquid hazardous materials to the GWF Tracy project site. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia.

INTRODUCTION

The purpose of this hazardous materials management analysis is to determine if the proposed GWF Tracy project has the potential to cause significant impacts on the public as a result of the use, handling, storage, or transportation of hazardous materials at the proposed site. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce those impacts to the extent feasible.

This analysis does not address the potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and provide them with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. The **WORKER SAFETY AND FIRE PROTECTION** section of this document describes applicable requirements for the protection of workers from these risks.

Aqueous ammonia (29.5% ammonia in aqueous solution) is the only acutely hazardous material proposed to be either used or stored at the GWF Tracy project in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j) (GWF 2008a, Table 5.5-2). Aqueous ammonia will be used to control oxides of nitrogen (NO_x) emissions through selective catalytic reduction. The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with the use of the more hazardous anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the anhydrous form, which is stored as a liquefied gas at high 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 and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain than those associated with anhydrous ammonia, and emissions from such spills are limited by the slow mass transfer from the surface of the spilled material.

Other hazardous materials, such as mineral and lubricating oils, cleaning detergents, water treatment chemicals and welding gasses will be present at the proposed GWF Tracy project. Hazardous materials used during construction would include gasoline, diesel fuel, motor oil, hydraulic fluid, welding gases, lubricants, solvents, paint, and paint thinner. No acutely toxic hazardous materials will be used on site during construction. None of these materials pose significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and/or their environmental mobility. Handling of hazardous materials during construction would follow Best Management Practices (BMPs) to minimize the potential affects of hazardous materials incidents (GWF 2008a, Section 5.5.4.1).

Although no natural gas is stored, the project will also involve the handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. Natural gas would be delivered by the Pacific Gas and Electric Company (PG&E) via an existing gas pipeline that currently supplies the Tracy Peaker Project (TPP). This gas line would be connected to the proposed GWF Tracy project without requiring any off-site pipeline segments or any additional pressurization equipment (GWF 2008a, Section 4.1). The GWF Tracy project would also require the transportation of aqueous ammonia to the facility. This document addresses all potential impacts associated with the use and handling of hazardous materials.

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.

Hazardous Materials Management Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.)	Contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III).
The Clean Air Act (CAA) of 1990 (42 USC 7401 et seq. as amended)	Established a nationwide emergency planning and response program and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials.
The CAA section on risk management plans (42 USC §112(r)	Requires states to implement a comprehensive system informing local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.
49 CFR 172.800	The U.S. Department of Transportation (DOT) requirement that suppliers of hazardous materials prepare and implement security plans.
49 CFR Part 1572, Subparts A and B	Requires suppliers of hazardous materials to ensure that all their hazardous materials drivers are in compliance with personnel background security checks.
The Clean Water Act (CWA) (40 CFR 112)	Aims to prevent the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Requires a written spill prevention, control, and countermeasures (SPCC) plan to be prepared for facilities that store oil that could leak into navigable waters.
Title 49, Code of Federal Regulations, Part 190	Outlines gas pipeline safety program procedures.
Title 49, Code of Federal Regulations, Part 191	Addresses 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 DOT of any reportable incident by telephone and then submit a written report within 30 days.
Title 49, Code of Federal Regulations, Part 192	Addresses transportation of natural and other gas by pipeline and minimum federal safety standards, specifies minimum safety requirements for pipelines including material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use that characterize the surrounding land. This part also contains regulations governing pipeline construction (which must be followed for Class 2 and Class 3 pipelines) and the requirements for preparing a pipeline integrity management program.
Federal Register (6 CFR Part 27) interim final rule	A regulation of the U.S. Department of Homeland Security that requires facilities that use or store certain hazardous materials to submit information to the department so that a vulnerability assessment can be conducted to determine what certain specified security measures shall be implemented.

Applicable Law	Description
State	
Title 8, California Code of Regulations, section 5189	Requires facility owners to develop and implement effective safety management plans that 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 Risk Management Plan (RMP) process.
Title 8, California Code of Regulations, section 458 and sections 500 to 515	Sets forth requirements for the design, construction, and operation of vessels and equipment used to store and transfer ammonia. These sections generally codify the requirements of several industry codes, including the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, the American National Standards Institute (ANSI) K61.1 and the National Boiler and Pressure Vessel Inspection Code. These codes apply to anhydrous ammonia but are also used to design storage facilities for aqueous ammonia.
California Health and Safety Code, section 25531 to 25543.4	The California Accidental Release Program (CalARP) requires the preparation of a Risk Management Plan (RMP) and off-site consequence analysis (OCA) and submittal to the local Certified Unified Program Agency for approval.
California Health and Safety Code, section 255000 et seq.	Requires the preparation of a Hazardous Materials Business Plan (HMBP) is threshold quantities of certain chemicals are stored or used on-site. The HMBP will be submitted to the CUPA and the Tracy Fire Department.
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."
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)	Prevents certain chemicals that cause cancer and reproductive toxicity from being discharged into sources of drinking water.
California Public Utilities Commission General Order 112-E and 58-A	Contains standards for gas piping construction and service.
Local	
San Joaquin County Code Section 68.905	Incorporates by reference the California Heath and Safety Code Division 20, Chapter 6.11 which requires the facility to operate as a unified program facility.
San Joaquin County General Plan	Provides guidance for siting and management of facilities that store, collect, treat, dispose or transfer hazardous waste and hazardous materials.

The Certified Unified Program Authority (CUPA) with responsibility to review RMPs and Hazardous Materials Business Plans (HMBPs) is the San Joaquin County Environmental Health Department (GWF 2008a, Section 5.5.2.3). In regards to seismic safety issues, the site is located in Seismic Risk Zone 4. Construction and design of buildings and vessels storing hazardous materials will meet the seismic requirements of the California Building Code for Seismic Zone 4 (GWF 2008a, Table 2.5-1).

SETTING

Several factors associated with the area in which a project is to be located affect the potential for an accidental release of a hazardous material that could cause public health impacts. 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 both 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 potential magnitude and extent of public exposure to such materials, as well as their associated health risks. When wind speeds are low and the atmosphere stable, dispersion is severely reduced but can lead to increased localized public exposure.

Recorded wind speeds and directions are described in the **AIR QUALITY** section (5.1.1.2) and quarterly wind roses are provided in Appendix 5.1C of the Application for Certification (AFC) (GWF 2008a). Staff agrees with the applicant that use of F stability (stagnated air, very little mixing), wind speed of 1.0 meters per second, and an ambient temperature of 115°F are appropriate for the worst case scenario of the off-site consequence analysis (GWF 2008a, Table 5.5-6).

TERRAIN CHARACTERISTICS

The location of elevated terrain is often an important factor in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. The site topography is predominantly flat (about 175 feet above sea level), with a region of elevated terrain running Northwest to Southwest about one mile west of the proposed site (GWF 2008a, Section 5.1.1.1).

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 major bearing on health risk. There are 32 schools, nine day care facilities, one college, one medical facility, and two nursing homes within six miles of the proposed site. The nearest sensitive receptor is the George Kelly Elementary School, located approximately 1.5 miles northeast of the project site (GWF 2008a, Section 5.5.3). Also, the Tracy Unified School District is expected to complete the construction of the John C. Kimball High School for fall 2009 enrollment. The high school is located at 3200 Jaguar Run and is approximately 1.7 miles from the project site. Sensitive receptors within a six mile radius are listed in Appendix 5.5A and mapped in Figures 5.5-1a and 5.5-1b of the AFC (GWF 2008a).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals and natural gas were evaluated. Staff's analysis addresses the potential impacts on all members of the population including the young, the elderly, and people with existing medical conditions that may make them more sensitive to the adverse effects of hazardous materials. In order to accomplish this goal, staff utilized the most current public health exposure levels (both acute and chronic) that are established to protect the public from the effects of an accidental chemical release.

In order to assess the potential for released hazardous materials to travel off site and affect the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some hazardous materials must be used at power plants. Therefore, staff conducted its analysis by examining the choice and amount of chemicals to be used, the manner in which the applicant will use the chemicals, the manner by which they will be transported to the facility and transferred to facility storage tanks, and the way the applicant plans to store the materials on site.

Staff reviewed the applicant's proposed engineering and administrative controls concerning hazardous materials usage. Engineering controls are the physical or mechanical systems, such as storage tanks or automatic shut-off valves, that can prevent the spill of hazardous material from occurring, or which can either limit the spill to a small amount or confine it to a small area. Administrative controls are the rules and procedures that workers at the facility must follow that will help to prevent accidents or to 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 off site and causing harm to the public.

Staff reviewed and evaluated the applicant's proposed use of hazardous materials as described by the applicant (GWF Tracy 2008b, Section 6.15). 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 **Table 5.5-2** 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 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-sized 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 theoretical impacts on the public of a worst-case spill of hazardous materials, as reduced by the mitigation measures proposed by the applicant. When mitigation methods proposed by the applicant are sufficient, no further mitigation is recommended. If the proposed mitigation is not sufficient to reduce the potential for adverse impacts to an insignificant level, staff will propose additional prevention and response controls until the potential for causing harm to the public is reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Small Quantity Hazardous Materials

Hazardous chemicals such as mineral and lubricating oils, cleaning detergents, water treatment chemicals, welding gasses, and other various chemicals would be used and stored in relatively small amounts. (See **HAZARDOUS MATERIALS APPENDIX B** for a list of all chemicals proposed for use and storage at GWF Tracy). In conducting the analysis, staff determined in Steps 1 and 2 that these materials, although present at the proposed facility, pose a minimal potential for off-site impacts since they will be stored in small quantities, have low mobility/volatility, or have low levels of toxicity. These hazardous materials are eliminated from further consideration.

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2, staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials: natural gas and aqueous ammonia. However, the project will be limited to using, storing, and transporting only those hazardous materials listed in Appendix B of this document as per staff's proposed condition **HAZ-1**.

Large Quantity Hazardous Materials

Natural Gas

Natural gas poses a fire and/or possible explosion risk because of its flammability. Natural gas is composed mostly of methane, but also contains ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is 90% in concentration. Methane is flammable when mixed in air at concentrations of 5-14%, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or possible explosion if a release occurs under certain specific conditions. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1998), natural gas is less likely to cause explosions than many other fuel gases such as propane or liquefied petroleum gas, but can explode under certain conditions (as demonstrated by the natural gas detonation in Belgium in July 2004).

While natural gas would be used in significant quantities, it would not be stored on site. It would be delivered by PG&E via an existing pipeline that already services the Tracy

Peaker Project (TPP). Connecting the proposed GWF Tracy project to this gas line would not require any off-site piping or additional pressurizing equipment (GWF 2008a, Section 4.1).

The risk of a fire and/or explosion on site can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) code 85A requires both the use of double-block and bleed valves for gas shut off and automated combustion controls. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures would require air purging of the gas turbines prior to start up, thereby precluding the presence of an explosive mixture. The safety management plan proposed by the applicant would address the handling and use of natural gas and would significantly reduce the potential for equipment failure because of either improper maintenance or human error.

Aqueous Ammonia

Aqueous ammonia would be used to control the emission of oxides of nitrogen (NO_x) from the combustion of natural gas at the GWF Tracy project. The accidental release of aqueous ammonia without proper mitigation can result in significant down-wind concentrations of ammonia gas. GWF Tracy would store 29.5% aqueous ammonia solution in an existing aboveground storage tank with a maximum capacity of 9,000 gallons (GWF 2008a, Section 5.5.4.2). The ammonia storage tank is double walled and includes a secondary containment basin surrounding the tank.

Based on staff's analysis described above, aqueous ammonia is the only hazardous material that may pose a significant risk of off-site impact. The use of aqueous ammonia can result in the release of ammonia vapor in the event of a spill. This is a result of its moderate vapor pressure and the large amounts of aqueous ammonia that will be used and stored on site. However, the use of aqueous ammonia poses far less risk than the use of the far more hazardous anhydrous ammonia (ammonia that is not diluted with water).

To assess the potential impacts associated with an accidental release of aqueous ammonia, staff uses four benchmark exposure levels of ammonia gas occurring off site. These include:

1. The lowest concentration posing a risk of lethality, 2,000 parts per million (ppm);

2. The concentration immediately dangerous to life and health level of 300 ppm;

3. The emergency response planning guideline level 2 of 150 ppm, which is also the RMP level 1 criterion used by U.S. Environmental Protection Agency (EPA) and California; and

4. The level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm.

If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff will also assess the probability of occurrence of the release, the severity of the consequences, and the nature of the potentially exposed population in

determining whether the likelihood and extent of potential exposure are sufficient to support a finding of potentially significant impact. A detailed discussion of the exposure criteria considered by staff, as well as their applicability to different populations and exposure-specific conditions, is provided in **HAZARDOUS MATERIALS APPENDIX A**.

The applicant's off-site consequence analysis (OCA) was prepared for the TPP licensing process and is described in Section 5.5.4.3 of the GWF Tracy AFC and Section 8.12 of the TPP AFC (included in Appendix 1A of the GWF Tracy AFC). Pursuant to the California Accidental Release Program (CalARP) regulations and federal risk management plan regulations, the OCA was performed for the worst-case and alternative release scenarios, both involving a spill during truck unloading, which would drain from the sloped truck unloading area through a 10-inch pipe into an underground containment vault. Ammonia emissions from the two potential release scenarios were calculated following methods provided in the RMP off-site consequence analysis guidance, U.S. EPA, April 1999. A temperature slightly higher then the maximum summertime temperature recorded in Stockton during a 41-year period (115°F), a wind speed of 1.0 meters per second, and atmospheric stability class F were used for emission and dispersion calculations for the worst-case scenario. Potential off-site ammonia concentrations were estimated using the SCREEN3 numerical dispersion model.

Hazardous Materials Management Table 2 shows the applicant's modeled distance to four benchmark criteria concentrations resulting from the worst case and alternative release scenarios.

Hazardous Materials Management Table 2
Distance to Selected Toxic Endpoints

Scenario	Distance in Feet to Lethal Concentration (2,000 ppm)	Distance in Feet to IDLH level (300 ppm)	Distance in Feet to AIHA's ERPG-2 (200 ppm)	Distance in Feet to Energy Commission Level (75 ppm)
Worst Case (115°F, Class F, wind speed 1.0 m/s)	19	55	68	119
Alternative (90°F, Class D, wind speed 3.5 m/s)	4.75	20	25	41

Source: Table 5.5-7, GWF 2008a.

The results of the applicant's modeling predict that ammonia concentrations exceeding 75 ppm would not occur at any off-site location for either the alternative or the worst case release scenarios.

Staff had previously reviewed and accepted the OCA modeling for the TPP and had conducted its own independent modeling at the time. The results remain valid and staff sees no reason to perform any additional assessment.

Mitigation

The potential for accidents resulting in the release of hazardous materials is greatly reduced through implementation of a safety management program that would include the use of both engineering and administrative controls. Elements of both 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 affecting communities by incorporating engineering safety design criteria in the design of the project. The engineered safety features proposed by the applicant for use at the GWF Tracy project include:

- Use of the present secondary containment areas plus the addition of any needed areas for the few additional chemicals to be used, surrounding each of the hazardous materials storage areas designed to contain accidental releases that might happen during storage or delivery plus the volume of water associated with a 20-minute operation of fire suppression sprinklers;
- Physical separation of stored chemicals in isolated containment areas separated by a noncombustible partition in order to prevent accidental mixing of incompatible materials, which could result in the evolution and release of toxic gases or fumes;
- Installation of both an automatic sprinkler system and an exhaust system for indoor hazardous materials storage areas;
- Use of the present double-walled ammonia storage tank equipped with a bermed secondary containment basin;
- Use of the present underground tank located below the ammonia unloading area designed to collect any accidental releases during transfer; and
- Process protective systems including continuous tank level monitors, automated leak detection system, temperature and pressure monitors, alarms, excess flow and emergency isolation valves.

Administrative Controls

Administrative controls also help prevent accidents and releases (spills) from moving off site and affecting neighboring communities by establishing worker training programs, process safety management programs, and complying with all applicable health and safety laws, ordinances, and standards.

A worker health and safety program will be prepared by the applicant and include (but not be limited to) the following elements (see the **WORKER SAFETY AND FIRE PROTECTION** section for specific regulatory requirements):

- Worker training regarding chemical hazards, health and safety issues, and hazard communication;
- Procedures to ensure the proper use of personal protective equipment;
- Safety operating procedures for the operation and maintenance of systems utilizing hazardous materials;

- Fire safety and prevention; and
- Emergency response actions including facility evacuation, hazardous material spill clean-up, and fire prevention.

At the facility, the project owner will be required to designate an individual with the responsibility and authority to ensure a safe and healthful work place. The project health and safety official will oversee the health and safety program and have the authority to halt any action or modify any work practice to protect the workers, facility, and the surrounding community in the event of a violation of the health and safety program.

The existing TPP project has a risk management plan for aqueous ammonia as required by CalARP regulations and which has previously been reviewed and approved by the CPM and the CUPA. The RMP includes a program for the prevention of accidental releases and a program for responding to an accidental release of aqueous ammonia (GWF 2008a, Section 5.5.6.3). The hazardous materials business plan (HMBP) prepared for the existing TPP and which incorporates state requirements for the handling of hazardous materials must be updated by the applicant to include all chemicals used by GWF Tracy (GWF 2008a, Section 5.5.6.4). Other administrative controls would be required in proposed Conditions of Certification **HAZ-1** (limitations on the use and storage of hazardous materials and their strength and volume) and **HAZ-3** (development of a safety management plan).

On-Site Spill Response

In order to address the issue of spill response, the facility will prepare and implement an emergency response plan that includes information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, and prevention equipment and capabilities, as well as other elements. Emergency procedures will be established which include evacuation, spill cleanup, hazard prevention, and emergency response.

Designated plant personnel would be trained as first responders and as hazardous material technicians to form a plant Hazmat response team. In the event of a large spill, backup support would be provided by the City of Tracy Fire Department (TFD). The TFD has a Hazardous Materials Team at Station #96, located approximately seven miles northeast of the project site (GWF 2008a, Section 5.16.4.5 and TFD 2009). The team consists of two trained Hazmat Technicians per shift and has a response time of 14 minutes to the project site. In the event of a large spill, the County Hazmat team which consists of units from several fire departments would be called upon. The response time for the County's team could range between one and two hours. Staff finds that the available hazmat teams are capable of responding to a hazardous materials emergency call from GWF Tracy with an adequate response time**.**

Transportation of Hazardous Materials

Hazardous materials including aqueous ammonia will be transported to the facility by tanker truck. While many types of hazardous materials will be transported to the site, staff believes that transport of aqueous ammonia poses the predominant risk associated with hazardous materials transport.

Ammonia can be released during a transportation accident and the extent of impact in the event of such a release would depend upon the location of the accident and the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent upon three factors:

- The skill of the tanker truck driver;
- The type of vehicle used for transport; and
- Accident rates.

To address this concern, staff evaluated the risk of an accidental transportation release in the project area. Staff's analysis focused on the project area after the delivery vehicle leaves the main highway, either I-580 or I-205. Staff believes it is appropriate to rely upon the extensive regulatory program that applies to the shipment of hazardous materials on California highways to ensure safe handling in general transportation (see Federal Hazardous Materials Transportation Law 49 USC §5101 et seq, DOT regulations 49 CFR subpart H, §172–700, and California Department of Motor Vehicles (DMV) regulations on hazardous cargo). These regulations also address the issue of driver competence. See AFC section 5.12 for additional information on regulations governing the transport of hazardous materials.

To address the issue of tanker truck safety, aqueous ammonia will be delivered to the proposed facility in DOT-certified vehicles with design capacities of 6,700 gallons. These vehicles will be designed to DOT Code MC-307. These are high-integrity vehicles designed to haul caustic materials such as ammonia. Staff proposes Condition of Certification **HAZ-4** to ensure that, regardless of which vendor supplies the aqueous ammonia, delivery will be made in a tanker that meets or exceeds the specifications described by these regulations.

To address the issue of accident rates, staff reviewed the technical and scientific literature on hazardous materials transportation (including tanker trucks) accident rates in the United States and California. Staff relied on six references and three federal government databases to assess the risk of a hazardous materials transportation accident.

Staff used the data from the Davies and Lees (1992) article (which references the 1990 Harwood et al. study and 1993 Harwood study), to determine that the frequency of release for the transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per 1,000,000 miles traveled on well-designed roads and highways. The maximum use of aqueous ammonia during peak operation of the proposed GWF Tracy project would require about five tanker truck deliveries of aqueous ammonia per month. Normal operation would require between one and three truck deliveries per month (GWF 2008a, Section 5.5.6.3). Using a conservative average of four deliveries per month, the project would require about 48 deliveries per year, each delivering 6,700 gallons. Each delivery will travel approximately 3.5 miles from I-580 along Patterson Pass Rd and West Schulte Rd or approximately 4.8 miles from I-205 along Mountain House Pkwy and West Schulte Rd to the facility (GWF 2008a, Section 5.12.4.5 and Google Maps).

This would result in about 168 miles of delivery tanker truck travel in the project area per year (with a full load) for trucks arriving from I-580, and about 230 miles for trucks arriving from I-205. Staff believes that the risk of a release of aqueous ammonia due to an accident over this distance is insignificant. This can be compared to data from the U.S. DOT show that the actual risk of a fatality – not just a release - over the past five years from all modes of hazardous material transportation (rail, air, boat, and truck) is approximately 0.1 in 1,000,000.

In addition, staff used a transportation risk assessment model (developed by staff) in order to calculate the probability of an accident resulting in a release of a hazardous material due to delivery from the freeway to the facility along local roads. Results show a risk of 0.5 in 1,000,000 for one trip from I-580 and a risk of 0.8 in 1,000,000 for one trip from I-205. The total annual risk of a release was calculated to be 23.5 in 1,000,000 and 38 in 1,000,000 for deliveries from I-580 and I-205, respectively. This risk was calculated using accident rates on various types of roads (in this case, rural multilane undivided, rural multilane divided, and two-lane) with distances traveled on each type of road computed separately. Although it is an extremely conservative model in that it includes risk of accidental release from all modes of hazardous materials transportation and does not distinguish between a high-integrity steel tanker truck and other less secure modes, the results still show that the risk of a transportation accident is insignificant. Staff also uses the benchmark of 1×10^{-4} fatalities per year (equivalent to one fatality per 10,000 years or 100 in 1,000,000) for societal risk as the acceptable level of risk.

Staff therefore believes that the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility is insignificant because of the remote possibility that an accidental release of a sufficient quantity could be dangerous to the public. The transportation of similar volumes of hazardous materials on the nation's highways is neither unique nor infrequent. Staff's analysis of the transportation of aqueous ammonia to the proposed facility (along with data from the U.S. DOT) demonstrates that the risk of accident and exposure is less than significant.

Staff also assessed the transportation route itself and determined that because the route was through an industrial/commercial corridor with no schools, hospitals, day care centers, parks, or recreation areas along the route, it was the most appropriate and most direct route for hazardous materials transportation to the project site. This route has been used by the existing TPP without incident for the past several years. Accordingly, the project owner will be required by **HAZ-5** to direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM. Trucks will travel on I-580 to Patterson Pass Rd. to West Schulte Rd. to the plant site or on I-205 to Mountain House Rd. to West Schulte Rd. to the plant site.

Based on the environmental mobility, toxicity, the quantities at the site, and frequency of delivery, it is staff's opinion that aqueous ammonia poses the predominate risk associated with both use and hazardous materials transportation. Staff concludes that the risk associated with the transportation of other hazardous materials to the proposed project does not significantly increase the risk of ammonia transportation.

Seismic Issues

It is possible that an earthquake could cause the failure of a hazardous materials storage tank. An earthquake could also cause failure of the secondary containment system (berms and dikes), as well as the failure of electrically controlled valves and pumps. The failure of all of these preventive control measures might then result in a vapor cloud of hazardous materials that could move off site and affect 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, in January 1995, have all heightened concerns about earthquake safety.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused both to several large storage tanks and to smaller tanks associated with the water treatment system of a cogeneration facility. The 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 when designing and building storage tanks and containment areas to withstand a large earthquake. Staff also reviewed the impacts of the February 2001 Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes as California. No hazardous materials storage tanks failed as a result of that earthquake. Referring to the sections on **GEOLOGIC HAZARDS AND RESOURCES** and **FACILITY SAFETY DESIGN** in the AFC, staff notes that the proposed facility will be designed and constructed to the standards of the California Building Code for Seismic Zone 4 (GWF 2008a, Table 2.5-1).

Therefore, on the basis of what occurred in Northridge with older tanks and the lack of failures during the Nisqually earthquake (with newer tanks), staff determined that tank failures during seismic events are not probable and do not represent a significant risk to the public.

Site Security

The applicant proposes to use hazardous materials identified by the U.S. EPA as requiring the development and implementation of special site security measures to prevent unauthorized access. The U.S. EPA published a Chemical Accident Prevention Alert regarding site security (EPA 2000a), the U.S. Department of Justice published a special report entitled *Chemical Facility Vulnerability Assessment Methodology* (US DOJ 2002), the North American Electric Reliability Council published *Security Guidelines for the Electricity Sector* in 2002 (NERC 2002), and the U.S. Department of Energy (DOE) published the draft *Vulnerability Assessment Methodology for Electric Power Infrastructure* in 2002 (DOE 2002). The energy generation sector is one of 14 areas of critical infrastructure listed by the U.S. Department of Homeland Security. On April 9, 2007, the U.S Department of Homeland Security published in the Federal Register (6 CFR Part 27) an interim final rule requiring that facilities that use or store certain hazardous materials conduct vulnerability assessments and implement certain specified security measures. This rule was implemented with the publication of Appendix A, the list of chemicals, on November 2, 2007. Aqueous ammonia solutions of 20% or greater are included on this list and therefore the proposed GWF Tracy must comply with this rule and security requirements.

The project site would be located within the existing TPP site and would therefore be protected by the security measures already in place for the TPP. The applicant has provided an outline for a Security Plan which would include a description of perimeter fencing and breach detectors, alarms, site access procedures for employees and vendors, site personnel background checks, evacuation procedures, and law enforcement contacts in the event of a security breach (GWF 2008a, Section 5.5.6.5.2). Staff has previously conducted an audit of the security measure for the TPP and found those measures to be excellent. Therefore, no additional security measures other than new federal requirements are proposed for the operation phase of this project. These new requirements are proposed in condition **HAZ-7**.

The only portion of the GWF Tracy project that would be located outside the TPP fenceline is the 12.3-acre construction lay down area (GWF 2008a, Section 2.1). In order to secure the project during construction, staff proposes Condition of Certification **HAZ-6** that requires the applicant to prepare a construction security plan that would include a description of perimeter security for the lay down area.

CUMULATIVE IMPACTS AND MITIGATION

Staff analyzed the potential for the existence of cumulative impacts. A significant cumulative hazardous materials impact is defined as the simultaneous uncontrolled release of hazardous materials from multiple locations in a form (gas or liquid) that could cause a significant impact where the release of one hazardous material alone would not cause a significant impact. Existing locations that use or store gaseous or liquid hazardous materials, or locations where such facilities might likely be built, were both considered. The applicant provided a list of projects that may contribute to a cumulative impact (Table 5.6-6). Because significant impacts from the accidental release of hazardous materials stored at the site will be limited to the site, staff concludes that none of the listed projects have the potential to contribute to a hazardous materials cumulative impact.

The applicant will develop and implement a hazardous materials handling program for GWF Tracy independent of any other projects considered for potential cumulative impacts. Staff believes that the facility, as proposed by the applicant and with the additional mitigation measures proposed by staff, poses an insignificant risk of accidental release that could result in off-site impacts. Therefore, staff concludes that the facility would not contribute to a significant hazardous materials-related cumulative impact.

Staff believes that while cumulative impacts are theoretically possible, they are not probable because of the many safeguards implemented to both prevent and control an uncontrolled release. The chances of one uncontrolled release occurring are remote. The chance of two or more occurring simultaneously, with resulting airborne plumes mingling to create a significant impact, are even more remote. Staff believes the risk to the public is insignificant.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No hazardous materials-related comments have been received.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Based upon the above information, staff concludes that construction and operation of the GWF Tracy project would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS) regarding long-term and short-term project impacts in the area of hazardous materials management.

CONCLUSIONS

Staff's evaluation of the proposed project (with proposed mitigation measures) indicates that hazardous material use will pose no significant impact to the public. Staff's analysis also shows that there will be no significant cumulative impact. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable LORS. The applicant will not be required to update or revise the Risk Management Plan (RMP) but will be required to update the Hazardous Materials Business Plan (HMBP). To ensure the adequacy of the HMBP, staff's proposed conditions of certification require that it be submitted for concurrent review by the San Joaquin County Environmental Health Department and by Energy Commission staff. In addition, staff's proposed conditions of certification require the review and approval of a Safety Management Plan by staff prior to the delivery of any liquid hazardous material to the facility. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia, in addition to site security matters.

Staff recommends that the Energy Commission impose the proposed conditions of certification, presented herein, to ensure that the project is designed, constructed, and operated to comply with all applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release. If all mitigation proposed by the applicant and staff are required and implemented, the use, storage, and transportation of hazardous materials will not present a significant risk to the public.

Staff proposes six conditions of certification mentioned throughout the text (above), and listed below. Condition of Certification **HAZ-1** ensures that no hazardous material would be used at the facility except as listed in **APPENDIX B** of the staff assessment, unless there is prior approval by the Energy Commission compliance project manager. Condition of Certification **HAZ-2** requires that the existing HMBP be updated and submitted prior to the delivery of aqueous ammonia.

Staff believes that an accidental release of aqueous ammonia during transfer from the delivery tanker to the storage tank is the most probable accident scenario and therefore proposes Condition of Certification **HAZ-3** requiring the development of a safety management plan for the delivery of all liquid hazardous materials, including aqueous ammonia. The development of a safety management plan addressing the delivery of all liquid hazardous materials during construction, commissioning, and operations will further reduce the risk of any accidental release not addressed by the proposed spill-prevention mitigation measures. This plan would additionally prevent the mixing of incompatible materials that could result in toxic vapors. The transportation of hazardous

materials is addressed in Conditions of Certification **HAZ-4** and **HAZ-5**. Site security during the construction phases is addressed in Condition of Certification **HAZ-6** and that for operations in **HAZ-7.**

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous materials not listed in Appendix B, below, or in greater quantities or strengths than those identified by chemical name in Appendix B, below, unless approved in advance by the Compliance Project Manager (CPM).

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

HAZ-2 The project owner shall provide an updated Hazardous Materials Business Plan to the San Joaquin County Environmental Health Department (SJCEHD) and the Tracy Fire Department for review and to the CPM for review and approval.

Verification: At least thirty (30) days prior to receiving any hazardous material on the site for the commencement of commissioning ("first fire"), the project owner shall provide a copy of the Hazardous Materials Business Plan to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of aqueous ammonia and other liquid hazardous materials by tanker truck. The plan shall include procedures, protective equipment requirements, training, and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials including provisions to maintain lockout control by a power plant employee not involved in the delivery or transfer operation. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least thirty (30) days prior to the delivery of any liquid hazardous material to the facility for commissioning, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles which meet or exceed the specifications of DOT Code MC-307.

Verification: At least thirty (30) days prior to receipt of aqueous ammonia on site for commissioning, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-5 At least thirty (30) days prior to receipt of any hazardous materials on site, the project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM. Trucks will travel on I-580 to Patterson Pass Rd. to West Schulte Rd. to the plant site or on I-205 to

Mountain House Rd. to West Schulte Rd. to the plant site. The project owner shall obtain approval of the CPM if an alternate route is desired.

Verification: At least thirty (30) days prior to receipt of any hazardous materials on site, the project owner shall submit to the CPM for review and approval copies of notices to hazardous materials vendors describing the required transportation route.

HAZ-6 Prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Security Plan shall include the following:

1. Perimeter security consisting of fencing enclosing the construction lay down area;
2. Security guards;
3. Site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on site or off site;
5. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
6. Evacuation procedures.

Verification: At least thirty (30) days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-7 The project owner shall also prepare an updated site-specific security plan for the commissioning and operational phases that will be available to the CPM for review and approval. The project owner shall implement site security measures that address physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that which presently exists at the Tracy Peaker Project site with the following additions:

The Operation Security Plan shall include the following:

1. Written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site;
2. A. A statement (refer to sample, **Attachment A**), signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy;

B. A statement(s) (refer to sample, **Attachment B**), signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner), that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractors who visit the project site;

3. A statement(s) (refer to sample, **Attachment C**), signed by the owners or authorized representative of hazardous materials transport vendors, certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.880, and that they have conducted employee background investigations in accordance with 49 CFR Part 1572, subparts A and B;

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to those security plans. The CPM may authorize modifications to these measures, or may require additional measures such as protective barriers for critical power plant components—transformers, gas lines, and compressors—depending upon circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with both appropriate law enforcement agencies and the applicant.

Verification: At least thirty (30) days prior to the start of commissioning ("first fire"), the project owner shall notify the CPM that an updated site-specific operations site security plan is available for review and approval. In the annual compliance report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and that updated certification statements have been appended to the operations security plan. In the annual compliance report, the project owner shall include a statement that the operations security plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

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HAZARDOUS MATERIALS
APPENDIX A

Basis for Staff's Use of 75 Parts Per Million Ammonia Exposure Criteria

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BASIS FOR STAFF'S USE OF 75 PARTS PER MILLION AMMONIA EXPOSURE CRITERIA

Staff uses a health-based airborne concentration of 75 parts per million (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 the U.S. Environmental Protection Agency and the California Environmental Protection Agency in evaluating such releases pursuant to the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's analysis of the proposed project. 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 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. California Environmental Quality Act requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through feasible changes or alternatives 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.

Hazardous Materials 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 minutes	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 minutes	Protects nearly all segments of general population from irreversible effects.
STEL[2]	NIOSH	Adult healthy male workers	35 ppm	15 minutes, 4 times per 8-hour day	No toxicity, including avoidance of irritation.
EEGL[3]	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 minutes	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 minutes 30 minutes 10 minutes	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 hours	No toxicity or irritation on continuous exposure for repeated 8-hour 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 minutes	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) warned 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 HAZARDOUS MATERIALS APPENDIX A, TABLE 1

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ABBREVIATIONS FOR HAZARDOUS MATERIALS 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

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HAZARDOUS MATERIALS
APPENDIX B

Hazardous Materials Proposed for Use at the GWF TRACY

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Hazardous Materials Appendix B
Hazardous Materials Proposed for Use at the GWF Tracy Project

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site
Acetylene	74-86-2	Welding gas	Health: hazardous if inhaled Physical: combustible, flammable	650 ft^3
Aqueous Ammonia (29.5% NH_3 by weight)	7664-41-7	Control oxides of nitrogen (NOx) emissions through selective catalytic reduction	Health: irritation to permanent damage from inhalation, ingestion, and skin contact Physical: reactive, vapor is combustible	67,000 pounds
Carbon Monoxide (Balance Nitrogen)	630-08-0	CEMS Calibration Std.	Health: headaches, dizziness, convulsions, loss of consciousness, death Physical: flammable	1,600 ft^3
Citric Acid	77-92-9	Cleaning reverse osmosis units	Health: none Physical: non-flammable	Varies as needed (approx 100 pounds)
Cleaning chemicals/detergents for Turbine Wash	None	Periodic cleaning of combustion turbine	Health: refer to individual chemical labels Physical: refer to individual chemical labels	Varies as needed (approx 100 gallons)
Diesel No. 2	None	Fuel for fire pump engine/off-road vehicles	Health: may be carcinogenic Physical: flammable	200 gallons
General Dispersant – Cyanamer P-70	Proprietary	Anti-scalant Dispersant	Health: may irritate eyes and skin Physical: non-flammable	55 gallons
Hydraulic Oil	None	High-pressure combustion turbine starting system, turbine control valve actuators	Health: hazardous if ingested Physical: combustible	500 gallons
Hydrochloric Acid	7647-01-0	Lube Oil Cooler (WSAC) pH control	Health: strongly corrosive and toxic, toxic by ingestion, strong irritant to eyes and skin Physical: non-flammable	Varies as needed (approx 100 gallons)
Laboratory Reagents	None	Water/wastewater laboratory analysis	Health: refer to individual chemical labels Physical: refer to individual chemical labels	10 gallons liquids 100 pounds solids
Lubrication Oil	None	Lubricate rotating equipment (e.g., gas turbine and steam turbine bearings)	Health: hazardous if ingested Physical: flammable	40,000 gallons
Mineral Insulating Oil	8012-95-1	Transformers/switch yard	Health: hazardous if ingested Physical: may be flammable/combustible	80,000 gallons

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site
Nitric Oxide (balance Nitrogen)	10102-43-9	CEMS Calibration Std.	Health: irritating to eyes and respiratory system, cyanosis, inhalation may result in chemical pneumonitis and pulmonary edema Physical: non-flammable	2,200 ft^3
Oxygen/ Acetylene	7782-44-7	Welding Gas	Health: therapeutic overdoses can cause convulsions, liquid oxygen is an irritant to skin Physical: oxidizing agent, actively supports combustion	880 cubic feet
Permatreat PC-191	Proprietary	Scale inhibitor for reverse osmosis	Health: may cause irritation with prolonged contact Physical: non-flammable	400 gallons
Propylene Glycol	57-55-6	Antifreeze	Health: causes irritation Physical: combustible	2,000 gallons
Sodium Hydroxide (NaOH) (50% solution)	1310-73-2	Convert CO2 to alkalinity for removal by reverse osmosis	Health: corrosive, irritant to tissue in presence of moisture, strong irritant to tissue by ingestion Physical: non-flammable	500 gallons
Sodium Hypochlorite	7681-52-9	Water Treatment	Health: corrosive and toxic, toxic by ingestion, strong irritant to tissue Physical: fire risk when in contact with organic materials	120 gallons
Sodium Nitrate A DHS CFATS Chemical of Interest (must be <400 pounds)	7631-99-4	Cleaning of HRSG	Health: toxic, mildly toxic by ingestion Physical: non-flammable	Varies as needed (approx 500 pounds)
Sulfur Hexafluoride	2551-62-4	Switchyard/switchgear devices	Health: hazardous if inhaled Physical: non-flammable	200 pounds
Sulfuric Acid (Lead-Acid Batteries)	7664-93-9	Battery Electrolyte	Health: strongly corrosive, strong irritant to all tissue, minor burns to permanent damage to tissue Physical: non-flammable	3,000 pounds
Trisodium Phosphate (Na3PO4) (e.g., NALCO 7208)	7601-54-9	Boiler water alkalinity control	Health: corrosive and toxic, toxic by ingestion, irritant to tissue Physical: non-flammable	400 gallons

Source: GWF 2008a Tables 5.5-2 and 5.5-5

LAND USE

Testimony of Negar Vahidi and Jacob Hawkins

SUMMARY OF CONCLUSIONS

The proposed GWF Tracy Combined Cycle Power Plant Project (GWF Tracy or proposed project), with implementation of the recommended conditions of certification, would be consistent with the applicable laws, ordinances, regulations, and standards (LORS), pertaining to local land use planning and would not generate a significant land use impact under the California Environmental Quality Act (CEQA) guidelines. Energy Commission staff is proposing Condition of Certification **LAND-1** to ensure that the proposed project mitigates the permanent loss of 3.28 acres of agricultural land.

INTRODUCTION

The land use analysis focuses on the project's consistency with land use plans, ordinances, regulations, and policies and the project's compatibility with existing or reasonably foreseeable land uses. In addition, a power plant and its related facilities generally have the potential to create impacts in the areas of air quality, noise, dust, public health, traffic and transportation, and visual resources. These individual resource areas are discussed in detail in separate sections of this document.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Land Use LORS directly applicable to the proposed project and the surrounding area include the County of San Joaquin General Plan and the San Joaquin County Development Title. **Land Use Table 1** provides a general description of Land Use LORS applicable to the proposed project and surrounding lands. The project's consistency with these LORS is discussed in **Land Use Table 2**. The project site does not involve federally managed lands; therefore, there are no identified applicable federal land use related LORS.

Land Use Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	None
State	
Subdivision Map Act (Public Resources Code Section 66410-66499.58)	This section of the California Public Resources Code provides procedures and requirements regulating land division (subdivisions) and parcel legality. Regulation and control of the design and improvement of subdivisions have been vested in the legislative bodies of local agencies.

Applicable LORS	Description
Local	
San Joaquin County General Plan (SJC 1995a, SJC 1995b, SJC 2009a)	The San Joaquin County General Plan 2010, adopted in July 1992 and revised in 1995, reflects the values and contains the goals of the community with respect to development. The plan is general in nature and provides a vision of the future. The General Plan contains an evaluation of existing conditions and provides long-term goals and policies to guide growth and development through the year 2010. The General Plan is implemented by the county through its zoning, subdivision ordinances, specific plans, growth management policies, planned development districts, development agreements, development review, code enforcement, land use database, capital improvement programs, environmental review procedures, building and housing codes, and redevelopment plans. The General Plan includes community plans for each of the major urban and rural communities grouped by planning area. The proposed project site is located within San Joaquin County's Tracy Planning Area in the unincorporated area of the county, within a broader planning region called Mountain View. Although the project site is within the City of Tracy's Sphere-of-Influence[1] (SOI), it is outside the city's jurisdictional boundaries. The County General Plan does not have specified planning guidelines for this region. The General Plan elements applicable to the land use and agricultural resources associated with the proposed project are described below. San Joaquin County is in the process of updating the General Plan and in February 2005, adopted a revised Housing Element. The fully updated General Plan is not scheduled to be completed until 2011. Consequently, draft policies associated with the Draft General Plan Update would not be applicable to this project.
Title 9 – Development Title of San Joaquin County (SJC 1995c)	The Development Title functions similar to a zoning code, and establishes regulations to protect and promote the public health, safety and welfare. This is achieved by implementing and ensuring compliance of the general plan in order to guide and manage the future growth of the county; regulation of land use in a manner that will encourage and support the orderly development and beneficial use of lands within the county; minimizing adverse effects on the public resulting from the inappropriate creation, location, use or design of building sites, buildings, land uses, parking areas, or other forms of land development by providing appropriate standards for development; protecting and enhancing the significant natural, historic, archaeological and scenic resources within the county as identified by the county general plan; and providing assistance to the public.

[1] A Sphere of Influence (SOI) is defined as the "…probable physical boundaries and service area…" (Government Code §56076) of an agency. An SOI includes territory not within the corporate limits of the agency but which is expected to be annexed at some time in the future. There may be communities or territory closely connected with a proposed incorporation area which are not ready to be included in the new city but need to be acknowledged for future planning (GOPR 2003).

SETTING

PROPOSED PROJECT

GWF Tracy Site

The proposed 16.38-acre GWF Tracy site is located in an unincorporated area of San Joaquin County, approximately one mile southwest of the city of Tracy, and is located on a single parcel (Assessor Parcel Number 799-000-45). Project components would be installed on the existing 13.1-acre Tracy Peaker Project (TPP) site as well as on 3.28 acres of adjacent agricultural land within the 40-acre parcel owned by GWF. The 3.28 acres would be required for the relocation of the stormwater retention basin, relocation of the equipment storage area, and two transmission termination structures (GWF 2008a). The site is located 0.6 mile to the west of Lammers Road off of an unimproved access road. The access road is located immediately west of an existing industrial parcel, running 0.6 mile south from West Schulte Road.

Construction Laydown Area

The proposed project also consists of a 12.3-acre construction laydown area located adjacent to the proposed GWF Tracy site. The construction laydown area is located on the same 40-acre legal parcel of land (APN 799-000-45) owned by GWF, and consists of agricultural land that is not currently in production (GWF 2008a).

Other Project-Related Facilities

In addition to the proposed GWF Tracy site and construction laydown area, there are other features and facilities associated with the proposed project, including:

- Reconductoring of existing transmission lines (no ground disturbance would occur).Two segments of transmission line would be reconductored as follows:
    - Segment 2 (0.7 mile long), approximately nine miles north of the GWF Tracy site and approximately five miles northeast of the City of Tracy, southwest of the intersection of I-5 and I-205, and
    - Segment 3 (1.6 miles long) approximately nine miles north of the GWF Tracy site and approximately five miles northeast of the City of Tracy, northeast of the intersection of I-5 and I-205. Approximately 0.3 miles of the Segment 3 right-of-way (ROW) would cross into the City of Lathrop.
- Expansion of the existing PG&E Schulte Switching Station within the existing switching station fence line to loop in the existing 115-kV Tesla-Manteca transmission line (GWF 2008a). As all activities associated with this expansion would occur within the PG&E Schulte Switching Station, no lands would be disturbed in construction of this component.

For a detailed description of the proposed project components and associated facilities, see the **PROJECT DESCRIPTION** section of this document.

SURROUNDING AREA

Land uses surrounding the proposed GWF Tracy site include industrial and agricultural areas (GWF 2008a). Existing notable land uses in the area surrounding the proposed GWF Tracy site include:

- Union Pacific Railroad ROW bounding the proposed project to the north;
- Adjacent to the north of the railroad ROW, an industrial compound houses Owens-Brockway Glass Container, Inc., Nutting-Rice Tracy LLC, and Tracy Biomass Power Plant;
- To the northwest, across the Union Pacific Railroad ROW, a parcel owned by the Federal government and formerly used as a radio communication facility is now overgrown with grasses around the tall, mast-like transmitter poles;
- The Delta-Mendota Canal bounds the parcel to the southwest; and
- Kagehiro Ranch Inc. agricultural lands used in the production of flood-irrigated row crops forms the boundary to the east and south.

Lands surrounding transmission line Segments 2 and 3 include agricultural lands, commercial and residential properties, industrial parcels, open space, and transportation corridors, such as Interstate 580.

AGRICULTURAL LANDS

The proposed project site and surrounding area include agricultural lands that are currently or have in the recent past been used for agricultural production. The Williamson Act contract for the 40-acre parcel acquired by TPP expired in March 2002 prior to the submittal of the Application for Certification (01-AFC-16) for the TPP (GWF 2008a). The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) provides information on designation of soils in areas with agricultural lands (NRCS 2009a). The NRCS designates the proposed project site as largely consisting of prime farmland, with the southwestern edge of the site designated as unique farmland, and the northwestern edge of the site designated as farmland of local importance (GWF 2008a). The areas surrounding the GWF Tracy site, construction laydown area, and within 0.25 mile of transmission line Segments 2 and 3 predominately consist of lands designated by the NRCS as prime farmland (NRCS 2009a).

The Farmland Mapping and Monitoring Program (FMMP) of the California Department of Conservation (DOC) provides statistics on conversion of farmland to non-agricultural uses in San Joaquin County. The proposed GWF Tracy site, as well as Segments 2 and 3 of the transmission line reconductoring would all be located on, or would traverse, lands designated by the DOC as Prime Farmland under the FMMP. Additionally, Segment 3 would traverse short portions of grazing land and a small area of farmland of local importance as well as urban land (DOC 2009a). According to the San Joaquin County General Plan, the proposed GWF Tracy site, construction laydown area, and associated facilities all lie within lands designated as General Agriculture (A/G) by the San Joaquin County General Plan and zoned for agricultural activities (AG-40) under the county's Development Title. The land use designation and zoning for the proposed project components are described further below (SJC 2009b).

GENERAL PLAN LAND USE AND ZONING DESIGNATIONS

San Joaquin County's General Plan designates the GWF Tracy site as General Agriculture (A/G). This designation applies to areas suitable for agriculture outside of areas planned for urban development where the soils are capable of producing a wide variety of crops and/or supporting grazing; parcel sizes are generally large enough to support commercial agricultural activities; and there exists a commitment to commercial agriculture in the form of Williamson Act contracts and/or capital investments. Typical uses include crop production, feed and grain storage and sales, crop spraying, and animal raising and sales. Segment 2 of the transmission line reconductoring would also be located on lands designated A/G (SJC 1995b, SJC 2009b). In addition to traversing City of Lathrop lands designated for Urban Reserve and Recreation Commercial, Segment 3 of the transmission line reconductoring would be located on land designated A/G in unincorporated San Joaquin County, as well as Open Space/ Resource Conservation (OS/RC), designated for areas with significant resources that generally are to remain in open space, and Commercial/Freeway Service (C/FS), for commercial uses oriented almost exclusively to serving the needs of the freeway traveler (SJC 1995a, SJC 2009b, COL 2009a).

The San Joaquin County Development Title categorizes the proposed GWF Tracy site and construction laydown area within the AG-40 zone. This zone is established to preserve agricultural lands for the continuation of commercial agriculture enterprises. Minimum parcel sizes within the AG Zone are 20, 40, 80 or 160 acres, as specified by the precise zoning. Under this zoning, Minor Utility uses are permitted and Major Utility uses are permitted subject to site approval. Segment 2 of the transmission line reconductoring would be located on lands zoned AG-40 (SJC 1995c, SJC 2009b). Segment 3, in addition to traversing City of Lathrop lands zoned as Urban Reserve, traverses San Joaquin County lands zoned as AG-40 and C-FS, intended to provide areas adjacent to full freeway interchanges for commercial uses oriented to serve the needs of the highway traveler (SJC 1995c, SJC 2009b, COL 2009b).
While GWF Tracy is located within the City of Tracy's Sphere-of–Influence (SOI), as this property is in unincorporated San Joaquin County and has not yet been annexed by the City of Tracy, the City of Tracy's LORS are not applicable to the project.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Energy Commission staff has analyzed the information provided in the AFC and has acquired information from other sources to determine consistency of the proposed GWF Tracy with applicable land use LORS and the proposed project's potential to have significant adverse land use-related impacts. In addition, conditions developed by staff to reduce any potential impacts to a less than significant level are provided, as well as a discussion of the feasibility and enforceability of the recommended conditions of certification.

METHOD AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Significance criteria used in this document are based on Appendix G of the CEQA Guidelines (CCR 2006a) and performance standards or thresholds identified by the

Energy Commission staff, as well as applicable LORS utilized by other governmental regulatory agencies. An impact may be considered significant if the proposed project results in:

- Conversion of Farmland[2]
  - Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency.
  - Conflict with existing zoning for agricultural use, or a Williamson Act contract.
  - Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural uses.
- Physical disruption or division of an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction, or that would normally have jurisdiction, over the project. This includes, but is not limited to, a general plan, redevelopment plan, or zoning ordinance.
- Individual environmental effects, which, when considered with other impacts from the same project or in conjunction with impacts from other closely related past, present, and reasonably foreseeable future projects, are considerable, compound, or increase other environmental impacts.

In general, a power plant and its related facilities may also be incompatible with existing or planned land uses, resulting in potentially significant impacts, if they create unmitigated noise, dust, or a public health or safety hazard or nuisance; result in adverse traffic or visual impacts; or preclude, interfere with, or unduly restrict existing or future uses. Please see other sections of this document, as noted, for a detailed discussion of any additional potential project-related impacts and recommended mitigation and conditions of certification.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Conversion of Farmland

The potential environmental consequences relating to land use arise mainly due to the temporary conversion of 12.3 acres of Prime Farmland for construction laydown and permanent conversion of 3.28 acres of Prime Farmland for expansion of the GWF Tracy site. Because the applicant has agreed, upon completion of construction, to return the

[2] In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment (LESA) Model prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland (CCR2006a). The intent of the LESA Model is to provide land use analysts with a quantitative means of determining agricultural land and Farmland disturbance acreages and quantitative thresholds to determine the level of severity of those land disturbance impacts. The results of the LESA Model are then used to determine the occurrence of significant impacts on agricultural lands and Important Farmlands based on the CEQA Guidelines Appendix G thresholds of significance. Note that the California Energy Commission uses the LESA Model to assess impacts to agricultural lands for proposed power generation facilities.

12.3-acre laydown area to its pre-construction condition in the manner described in the TPP's existing agricultural mitigation plan, use of the laydown area does not contribute to conversion of farmlands in the region.

As described in detail above under the section entitled **AGRICULTURAL LANDS**, multiple governmental agencies at the federal, State, and local level have information regarding the agricultural lands relating to the proposed project and the surrounding area. To summarize, following is a list of the various designations or categorizations these multiple governmental agencies have provided for the proposed project site and construction laydown area:

- **USDA NRCS:** According to the Web Soil Survey administered, the NRCS designates the proposed project and the surrounding area as agricultural lands/farmlands. Specifically, the NRCS classifies the project site and areas traversed by the reconductoring of transmission line Segments 2 and 3 as prime agricultural land (NRCS 2009a).
- **California DOC:** Under the standard FMMP mapping criteria, the site and areas traversed by the reconductoring of transmission line Segments 2 and 3 would be considered Prime Farmland (DOC 2009a).
- **San Joaquin County:** The San Joaquin County General Plan designates the GWF Tracy site and areas traversed by the reconductoring of transmission line Segments 2 and 3 as A/G and the Development Title zones these lands as AG-40 (SJC 2009b).
- **Williamson Act**: While the project site was previously under a Williamson Act contract, that contract expired in 2002. No ground disturbing activities would occur in an area that is under a Williamson Act contract (GWF 2008a).

Energy Commission staff uses information from governmental agencies to conduct its analysis of impacts to agricultural resources, and as provided for in the CEQA Guidelines Appendix G (Environmental Checklist Form, Item II, Agricultural Resources), "…[i]n determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment (LESA) Model prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland" (CCR 2006a). Staff often uses the LESA Model for assessment of impacts to agricultural lands for power generation facilities.

The LESA Model is an approach for rating the relative quality of land resources based upon specific measurable features. The formulation of a California Agricultural LESA Model is the result of Senate Bill 850 (Stats. 1993, ch. 812, section 3), which charged the Resources Agency, in consultation with the Governor's Office of Planning and Research, with developing an amendment to Appendix G of the California Environmental Quality Act (CEQA) Guidelines concerning agricultural lands. Such an amendment is intended "to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process" (Public Resources Code Section 21095).

The California Agricultural LESA Model is composed of six different factors. Two “Land Evaluation” (LE) factors are based upon measures of soil resource quality. Four “Site Assessment” (SA) factors provide measures of a given project’s size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, each of these factors is separately rated on a 100 point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. It is this project score that becomes the basis for making a determination of a project’s potential significance, based upon a range of established scoring thresholds (DOC 1997).

Staff conducted the LESA Model for the proposed 3.28-acre expansion of the GWF Tracy project site in accordance with the detailed instructions provided in the LESA Model Instruction Manual (DOC 1997a). Because the impacts to the 12.3-acre laydown area and stringing and pulling activities associated with the reconductoring of transmission line Segments 2 and 3 would last only until completion of construction, and because the applicant has agreed to return the laydown and stringing and pulling areas to their pre-construction conditions, the temporary use of these areas would not contribute to the permanent conversion of farmlands in the region, and thus staff did not include this acreage in the LESA analysis.

The completed LESA Model worksheets for the proposed project are included within **APPENDIX LU-1** at the end of this section. The LESA score is based on a scale of 0 to 100. The Final LESA score for the 3.28-acre expansion of the GWF Tracy site is 64.25. Note that both the LE and SA subscores for the proposed project site are over 20 points (see **APPENDIX LU-1**). Based on the California Agricultural LESA Thresholds[3], a score of 63.3 would result in a significant impact due to the permanent conversion of 3.28 acres of agricultural lands.

The direct and indirect impacts of proposed project implementation would be that 3.28 acres of agricultural land would be permanently converted to power plant facilities, which is a non-agricultural use. When agricultural land is converted, the effect can be experienced by the residents of the area as a loss of open space, a loss of farmland, and the encroachment of industrial uses into a non-industrial setting.

The applicant states in AFC Section 5.6.7.3 (Analysis of Potential Effects on Agriculture), that they expect to comply with measures similar to Condition of Certification LAND-2 from the TPP Final Decision in order to reduce impacts on agricultural resources to less than significant (GWF2008a). The TPP converted 13.1 acres of Prime Farmland to a non-agricultural use. Condition of Certification LAND-2 from the TPP Final Decision required the applicant to provide mitigation fees to the American Farmland Trust to compensate for Prime Farmland conversion impacts. It

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[3] California LESA Model Scoring Thresholds (DOC 1997, Table 9):

- 0 to 39 Points Not Considered Significant
- 40 to 59 Points Considered Significant (only if LE and SA subscores are each greater than or equal to 20 points)
- 60 to 79 Points Considered Significant (unless either LE or SA subscore is less than 20 points)
- 80 to 100 Points Considered Significant.

also required the applicant to develop an agricultural mitigation plan describing long-term management of the remaining agricultural operation on the unconverted portion of the 40-acre parcel where the TPP was located. With implementation of Condition of Certification LAND-2, the impacts associated with the conversion of Prime Farmland to non-agricultural uses were deemed to be less than significant. With the licensing and construction of TPP, this condition of certification was implemented, with the applicant rendering fees to American Farmland Trust and executing an agricultural mitigation plan, which is currently in effect for the existing TPP site.

As the impact on Prime Farmland is of the same nature for GWF Tracy and in the same area as the impacts to Prime Farmland associated with the TPP, staff recommends a condition of certification that mitigates for the permanent conversion of additional acreage of Prime Farmland resulting from the proposed project. Condition of Certification **LAND-1** requires GWF to mitigate for the conversion of 3.28 acres of Prime Farmland to non-agricultural use in the same manner as was required by TPP Condition of Certification LAND-2**.** GWF has already committed to the continued preservation of on-site agricultural land not converted for the TPP power generation facility in the TPP Condition of Certification LAND-2. The implementation of Condition of Certification **LAND-1** for GWF Tracy and GWF's continued compliance with TPP Condition of Certification LAND-2, through the TPP's existing agricultural mitigation plan, will help ensure that a total of 16.38 acres of agricultural lands of the same or higher quality are conserved within the county. The components included in Condition of Certification **LAND-1** are based on TPP Condition of Certification LAND-2 (currently in effect) as well as similar conditions of certification used in other Energy Commission siting projects (e.g., Starwood, Panoche, and East Altamont) where agricultural land was converted to nonagricultural uses. Staff believes that with the adoption and implementation of **LAND-1**, the impacts of agricultural land conversion would be reduced to less than significant levels, and there would be no net loss of productive agricultural land within San Joaquin County. Land Use staff considers the effects of the 12.3-acre construction laydown area and effects of stringing and pulling transmission line along Segments 2 and 3 on agricultural uses to be temporary, because the area would be restored to pre-construction conditions following construction.

While the project site was previously under a Williamson Act contract through 2002, this contract has expired and the county's AG-40 zoning designation allows for energy production subject to site approval. In consideration of the existing Tracy Peaker Project and San Joaquin County General Plan Policy CODPP 25, requiring the upgrade of existing infrastructure whenever feasible (as further discussed below), the GWF Tracy project would not conflict with the county's agricultural zoning. Construction activities associated with the stringing and pulling of transmission line Segments 2 and 3 would require the disturbance of 100-foot by 100-foot stringing and pulling sites at either end of each transmission line Segment. This would result in six sites, each approximately 0.23 acre in size, totaling a maximum of 1.4 acres of disturbance. As with the laydown area described above, however, the stringing and pulling sites would be temporary, lasting only the duration of the reconductoring activities and would not permanently convert any agricultural lands to non-agricultural uses and would not conflict with Williamson Act contracts or agricultural zoning. Therefore, proposed project components would not result in any conflict with existing Williamson Act contracts or existing agricultural zoning.

Physical Division of an Existing Community

The proposed GWF Tracy is located in a rural/industrial area of unincorporated San Joaquin County. The power plant would be located entirely on private property, on a 40-acre site, which contains the TPP. Access to the site and the adjacent construction laydown area would be along a 0.6-mile access road leading south from West Schulte Road. No existing roadways or pathways would be removed from service due to GWF Tracy. While scattered rural residences are located within a one-mile radius of the proposed GWF Tracy site, the residences are not located within any established residential communities or developments, and there would be no relocation of these residences as a result of GWF Tracy. Therefore, implementation of the proposed project would not result in any impacts associated with the physical division of an existing or established community.

Land Use Plan, Policy, or Regulation

As required by California Code of Regulations, Title 20, Section 1744, Energy Commission staff evaluates the information provided by the project owner in the AFC (and any amendments), project design, site location, and operational components to determine if elements of the proposed project would conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, or that would normally have jurisdiction over the project except for the Energy Commission's exclusive authority. As part of the licensing process, the Energy Commission must determine whether a proposed facility complies with all applicable state, regional, and local LORS (Public Resources Code section 25523[d][1]). The Energy Commission must either find that a project conforms to all applicable LORS or make specific findings that a project's approval is justified even where the project is not in conformity with all applicable LORS (Public Resources Code section 25525). When determining LORS compliance, staff is permitted to rely on a local agency's assessment of whether a proposed project is consistent with that agency's zoning and general plan. On past projects, staff has requested that the local agency provide a discussion of the findings and conditions that the agency would make when determining whether a proposed project would comply with the agency's LORS, were they the permitting authority. Any conditions recommended by an agency are considered by Energy Commission staff for inclusion in the proposed conditions of certification for the project.

As part of staff's analysis of local LORS compliance and to determine the county's view of the project's consistency with its general plan and zoning code, staff sent a letter to San Joaquin County on November 5, 2008, detailing the potential LORS compliance issues associated with the proposed GWF Tracy. Staff requested that the county provide its position on the proposed project's consistency with its general plan, zoning ordinance, and other applicable LORS (CEC 2008u). Staff also sent a letter to the City of Tracy on November 5, 2008, requesting input from the city on the project due to the city's SOI, proximity to the project site, and its participation in the TPP licensing process (CEC 2008v). As of this writing, neither agency has responded to these requests. Staff contacted the Deputy Director of the San Joaquin County Planning Division, Chandler Martin, and was told that the Planning Division had no intention to respond to the letter.

Based on staff's independent review of San Joaquin County's applicable LORS documents, the proposed GWF Tracy would be consistent with applicable land use

LORS (see **Land Use Table 2**) upon implementation of staff's proposed Condition of Certification **LAND-1**, which would ensure that effects on agricultural lands are mitigated such that county agricultural resources would be protected.

Land Use Table 2
Project Compliance with Adopted Land Use LORS

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Federal	None		
State			
Subdivision Map Act (Public Resources Code Section 66410-66499.58)	Provides procedures and requirements regulating land division (subdivisions) and parcel legality. Regulation and control of the design and improvement of subdivisions have been vested in the legislative bodies of local agencies.	Yes	As described in the 2001 FSA, GWF's parcel was created by means of a lot line adjustment and per TPP Condition of Certification LAND-1, GWF provided the Energy Commission with a copy of the recorded Certificate of Compliance, ensuring that the proposed site was legally subdivided. GWF Tracy is located on the same 40-acre legal parcel of land created by means of a lot line adjustment for the existing TPP. Therefore, the site is in compliance with the State Subdivision Map Act, because no additional lot line adjustment would be necessary for the proposed project.
Local			
San Joaquin County General Plan (SJC 1995a) Goals	Land Use Goal Provide a well-organized and orderly development pattern that seeks to concentrate urban development and protect the County's agricultural and natural resources	Yes (With Implementation of Condition of Certification **LAND-1**)	The loss of 3.28 acres of agricultural land as a result of the project's construction would not meet the county's goal of protecting county agricultural resources. Condition of Certification **LAND-1** would include payment of a mitigation fee for the conversion of agricultural land to the American Farmland Trust, which, with the continued compliance with the preservation of on-site agricultural land per GWF's existing agricultural mitigation plan, would mitigate the loss of agricultural land resulting from the proposed project. With implementation of **LAND-1,** the proposed project would be consistent with this general plan Land Use Goal.
Community Organization and Development Pattern Policies (CODPP)	The Community Organization and Development Pattern Policies contain provisions that relate to the physical development of the County, establishing its development and	Yes	GWF Tracy would be an expansion of the existing TPP and would be located adjacent to the industrial compound containing Owens-Brockway Glass Container, Inc., Nutting-Rice Tracy LLC, and Tracy Biomass Power Plant. The GWF Tracy site is located on agricultural land and would be

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	image. These policies provide a framework for ensuring the logical organization of residential, commercial, industrial, and public facilities and services. The following policies are specifically applicable to the proposed project: • Policy 7 Residential, commercial, and industrial development shall be shown on the general plan map only in communities identified in Figure IV-I, except in the following instances: A. contiguous industrial expansion of existing industrial areas; B. Freeway Service areas; C. Commercial Recreation areas; or D. Truck Terminal areas. • Policy 10 Development shall be compatible with adjacent uses. • Policy 11 Development should complement and blend in with its setting. • Policy 25 Existing infrastructure should be maintained and upgraded when feasible, to reduce the need for new facilities.		considered industrial development. However, the project would be sited in an area with similar character and compatible industrial land uses, allowing it to complement and blend in with its surrounding uses. Reconductoring of transmission line Segments 2 and 3 would occur on an existing transmission line within an existing ROW and would not change the existing character of the transmission corridor. GWF Tracy would be a contiguous expansion of the existing TPP, falling within the exception described in Policy 7, subsection (a). The proposed project and reconductoring of the transmission lines would be upgrades of existing facilities and would not create non-contiguous expansion. Consequently, the proposed project would be consistent with Policies 7, 10, 11, and 25.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Infrastructure Services Policies Utilities	Policy 4 The County shall encourage the use of existing transmission corridors for new lines, except in the case of electrical transmission lines over 500 kV, which for safety reasons shall be separated from existing corridors by at least 500 yards.	Yes	GWF Tracy would use existing transmission corridors, and existing transmission line structures for Segments 2 and 3. The lines on these towers would be reconductored, but would not require any other construction or modification to the existing transmission corridor. The two new transmission termination structures adjacent to the GWF Tracy site would be constructed in an existing transmission corridor. Because of these factors, the proposed project would be consistent with Policy 4.
	Policy 6 The County shall encourage utilities to route their facilities along property lines and where they will not interfere with agricultural operations or other land use activities.	Yes (With Implementation of Condition of Certification **LAND-1**)	With the exception of the two new transmission termination structures adjacent to the GWF Tracy site, transmission facilities associated with the project would require minimal ground disturbance. Reconductoring activities for Segments 2 and 3 would not interfere with any agricultural operations or other land use activities. The new transmission termination structures at the GWF Tracy site would permanently convert 3.28 acres of agricultural land. Implementation of Condition of Certification **LAND-1** would require on-site preservation of agricultural land on the property not used for the power generation facility and payment of a mitigation fee for the conversion of agricultural land to the American Farmland Trust, and would mitigate for the permanent loss of agricultural land. Condition of Certification **LAND-1** would mitigate for the loss of agricultural land and the proposed project would be consistent with Policy 6.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Agricultural Lands Policies Preservation of Agricultural Lands/Compatible Uses	Policy 5 Agricultural areas shall be used principally for crop production, ranching, and grazing. All agricultural support activities and non-farm uses shall be compatible with agricultural operations and shall satisfy the following criteria: A. The use requires a location in an agricultural area because of unusual site area requirements, operational characteristics, resource orientation, or because it is providing a service to the surrounding agricultural areas; B. The operational characteristics of the use will not have a detrimental impact on the management or use of surrounding agricultural properties; C. The use will be sited to minimize any disruption to the surrounding agricultural operations; and D. The use will not significantly impact transportation facilities, increase air pollution, or increase fuel consumption.	Yes	Similar to what was described in the 2001 TPP FSA, the project would comply with the stipulations of the Agricultural Lands Policy 5 because even though the proposed use is non-agricultural, GWF Tracy would need to locate on the existing agricultural site to make use of the resources the site provides (the electrical transmission and natural gas linear facilities and the water supply). The project site has also been designed to consolidate non-agricultural uses on the land to prevent disruption of the continued agricultural use on the remaining non-converted land. Additionally, implementation of Condition of Certification **LAND-1** mitigates the permanent loss of agricultural land. For a discussion of impacts to transportation facilities and air quality as they relate to Agricultural Land Policy 5(d), please see the **AIR QUALITY** and **TRANSPORTATION AND TRAFFIC** sections. Reconductoring of Segments 2 and 3 would be an upgrade of an existing use and any disruption of agricultural activities would be minimal and temporary in nature. Consequently, reconductoring activities would be compatible with agricultural operations and would meet the listed criteria.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	Policy 7 There shall be no further fragmentation of land designated for agricultural use, except in the following cases: A. Parcels for homesites may be created, provided that the general plan density is not exceeded. B. A parcel may be created for the purpose of separating existing dwellings on a lot, provided the Development Title regulations are met. C. A parcel may be created for a use granted by permit in the A-G zone, provided that conflicts with surrounding agricultural operations are mitigated.	Yes (With Implementation of Condition of Certification **LAND-1**)	As described above for the General Plan Land Use Goal, the loss of 3.28 acres of agricultural land would be considered "further fragmentation of agricultural land." GWF has committed to the continued preservation of on-site agricultural land on the property not used for the power generation facility in TPP Condition of Certification LAND-2. The continued preservation of on-site agricultural land combined with the implementation of Condition of Certification **LAND-1**, to provide payment of a mitigation fee for the conversion of agricultural land to the American Farmland Trust, would mitigate the fragmentation of agricultural land and bring the project into compliance with Agricultural Lands Policy 7. While the existing transmission line ROW fragments the agricultural lands traversed by transmission line Segments 2 and 3, reconductoring of Segments 2 and 3 would be an upgrade of an existing use and would not further fragment any agricultural land. Reconductoring activities would result in minimal disturbance to agricultural land, would last only for the duration of construction, and the land would be returned to its original condition, post-construction. Consequently, reconductoring would not conflict with Agricultural Lands Policy 7.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	Policy 8 To protect agricultural land, non-agricultural uses which are allowed in the agricultural areas should be clustered, and strip or scattered development should be prohibited.	Yes	The clustering of industrial uses (i.e. the existing TPP is adjacent to Owens-Brockway Glass Container, Inc., Nutting-Rice Tracy LLC, and Tracy Biomass Power Plant) complies with Agricultural Lands Policy 8, which restricts non-farm uses on agricultural lands to concentrated clusters. GWF Tracy is consistent with Agricultural Lands Policy 8 because expanding the TPP would continue the established pattern of clustering industrial uses on this parcel. Reconductoring of Segments 2 and 3 would not permanently change any agricultural land uses. Any effects on agricultural land would occur only during construction activities and any disturbed lands would be returned to their original condition upon completion of construction.
San Joaquin County Development Title Division 6: Agricultural Zones (SJC1995c)	Chapter 9-605.5 - Temporary Uses and Structures Table 9-605.4 lists Temporary Building Incidental to Construction Works as a permitted use for all Agricultural zones.	Yes	Construction of the proposed project components at the power generation facility site would require a 12.3-acre laydown area within the 40-acre property owned by GWF zoned AG-40. Construction activities at the laydown area would last only for the duration of construction before the land would be returned to its original condition. Consequently, staff believes temporary use of the laydown area would be incidental to construction of the proposed project and under Table 9-605.4 would be a permitted use.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	Chapter 9-6065.6 –Special Use Regulations Power Generating Facility A permit approval shall be subject to the following findings: 1. The source of the power requires locating the use in an area designated as Agricultural or Resource Conservation in the General Plan; 2. The use will not have a significantly detrimental effect on the agricultural activities in the vicinity; and 3. The site of the use can be rehabilitated for agricultural production or a permitted use in the AG zone if the power source is temporary.	Yes (With Implementation of Condition of Certification **LAND-1**)	The San Joaquin County Planning Department, in a September 18, 2001 record of findings on the compatibility of the TPP with the agricultural zoning of the parcel stated, "The sub findings under Section 9-605.6(d) can be made. Specifically, item (1) is satisfied as the area is designated as agricultural in the general plan. The source of power (the TPP) requires locating in this area designated as Agriculture, since the TPP requires access to natural gas, electric transmission interconnection, and water. The proximity of the infrastructure bringing natural gas, electrical interconnection and water to this site results in less expense, less environmental impacts, and less impacts to agriculture than another site. Item (2) is satisfied since only nine acres are to be disturbed and the immediate area contains existing industrial uses such as the Tracy Biomass Plant, the Owens-Brockway Glass Container Manufacturing Plant, and the Nutting-Rice Warehouse. Finally, the 169 MW produced by this power plant would benefit agriculture in the vicinity significantly more than any possible adverse impacts from the loss of nine acres" (SJC 2001). Because this finding was made for the TPP and the proposed project is an expansion of the TPP and would result in the conversion of fewer acres of Farmland than the TPP, staff believes that similar conclusions can be made about GWF Tracy. Staff addressed this issue in its November 5, 2008 letter to the San Joaquin County Community Development Department and requested the county's input. Because the county has not responded to the contrary on this issue, staff anticipates the county would find GWF Tracy a compatible use. Staff believes that with the preservation of on-site agricultural land under GWF's existing agricultural mitigation plan and implementation of Condition of Certification **LAND-1**, any significant impacts to farmland would be mitigated.

Land Use Compatibility

This section addresses the proposed project's compatibility with other existing land uses in the same setting. Land use compatibility refers to the physical compatibility of planned and existing land uses. For example, nuisance producing land uses such as heavy industry are often physically incompatible with residential land uses. As discussed in detail above under the section entitled **SETTING,** the proposed GWF Tracy is zoned agriculture (AG) and would be located in an area that consists of agricultural farmland. Surrounding properties are used primarily for agricultural and industrial purposes, including scattered rural residences associated with farming activities and lands protected under Williamson Act contracts. Sensitive receptors such as residences are within a one-mile radius of the project site.

When a jurisdictional authority, such as the County of San Joaquin, establishes zoning designations to implement its general plan, it is that agency's responsibility to ensure the compatibility of adjacent zoning and permitted uses and incorporate conditions and restrictions that ensure those uses will not result in a significant adverse impact ("minimum of detriment") to surrounding properties. It is therefore assumed that permitted electricity generating uses, or those deemed equivalent to a permitted use, sited on properties zoned Agriculture (AG), are compatible with surrounding uses. Those uses operating under a valid use permit would also be considered compatible.

Administrative or conditional use permitting requirements and project reviews under CEQA are in place to evaluate the compatibility of projects that are not a permitted use or that have elements that may adversely impact public safety, the environment, or that could interfere with or unduly restrict existing and/or future permitted uses. As noted in the discussions above (see **Land Use Table 2**), under the San Joaquin County Land Use Ordinance, electricity generation is an allowable use subject to approval which requires specific development and use standards. These requirements are described above in **Land Use Table 2** under **San Joaquin County Development Title Division 6: Agricultural Zones, Chapter 9-6065.6 –Special Use Regulations**. As described in **Land Use Table 2**, in 2001, San Joaquin County made conditional use permit findings that concluded that the TPP satisfied the requirements for a Major Utility in an AG-40 zone. The county stated that uses such as the TPP fall into the "Utility Services – Major" category, which are conditionally permitted in agricultural as well as industrial zones (SJC 2001). They noted that their conditional use permit findings needed to be limited to an examination of whether the applicant's proposal for the TPP would be an allowed use in an agricultural zone, rather than consideration of other zone or site options.

Staff addressed this issue in the November 5, 2008 letter to the San Joaquin County Community Development Department, asking if the county had any input in GWF Tracy's consistency with the requirements for "Utility Services – Major" in a parcel zoned AG-40. As of this writing, the county has not responded. Therefore, staff concludes that given the approval of the existing TPP in the area, as well as other industrial uses to the north of the site, such as Owens-Brockway Glass Container, Inc., Nutting-Rice Tracy LLC, and the Tracy Biomass Power Plant, the county would likely view such a land use type to be appropriately sited at the proposed location and consistent with its goals and objectives for development.

As described in **Land Use Table 2** under **San Joaquin County Development Title Division 6: Agricultural Zones, Chapter 9-605.5**, construction of the proposed project components at the existing power generation facility site would require a 12.3-acre laydown area within the 40-acre property owned by GWF and zoned as AG-40. Construction activities occurring at the laydown area would last only for the duration of construction before the land would be returned to its original condition. Consequently, temporary use of the laydown area would be considered incidental to construction of the proposed project and would be considered a permitted use. Therefore, land use impacts resulting from activities at the construction laydown area would be less than significant.

Sensitive Receptors

A proposed siting location may be considered an incompatible use if a new source of pollution or hazard is located within close proximity to a sensitive receptor. From a land use perspective, sensitive receptor sites are those locations where people who would be more adversely affected by pollutants, toxins, noise, dust, or other project-related consequence or activity are likely to live or gather. Children, those who are ill or immune-compromised, and the elderly are generally considered more at risk from environmental pollutants. Therefore, schools, along with day-care facilities, hospitals, nursing homes, and residential areas, are considered to be sensitive receptor sites for the purposes of determining a potentially significant environmental impact. Depending on the applicable code, proximity is defined as “within 1000 feet” of a school (California Health & Safety Code §§42301.6–9) or within 0.25 mile of a sensitive receptor, under CEQA (CCR2006a; CCR 2008). Proximity is not necessarily a determining factor for a potentially significant impact, but is the threshold generally used to require further evaluation.

The proposed GWF Tracy would be within one mile of scattered agriculture-related rural residences. Existing permitted industrial uses in the project area include TPP and the Tracy Biomass Power Plant (both power generation facilities), as well as manufacturing facilities like the Owens-Brockway Glass Container, Inc. and Nutting-Rice Tracy LLC facilities. Once operational the proposed project would be similar in nature to these existing surrounding uses.

As described in **Land Use Table 2**, and supported by San Joaquin County’s previous findings for the TPP, from a land use perspective, the siting of the GWF Tracy at the proposed location would be compatible with surrounding sensitive receptors. The **AIR QUALITY, HAZARDOUS MATERIALS MANAGEMENT, NOISE, PUBLIC HEALTH, TRAFFIC AND TRANSPORTATION,** and **VISUAL RESOURCES** sections provide detailed analyses of the noise, dust, public health hazards or nuisance, and adverse traffic or visual impacts on surrounding sensitive receptors.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, section 15130).

As noted in the AFC, existing and proposed projects in the vicinity of the GWF Tracy site include residential dwellings and industrial facilities, and of the 10 planned and approved projects, three propose new residential construction. This new residential construction is largely a component of mixed use plans which typically also include commercial and light industrial components. Two projects including residential development occur within one mile of the proposed project, including the Ellis Specific Plan and Tracy Hills development. In 2000, city of Tracy voters passed Measure A, a modification to the city's growth management ordinance. Measure A limits the number of building permits to 600 per year. At the time Measure A was approved, they city already had issued approximately 6,000 permits for new housing. As such, the city of Tracy estimates that it will not issue any new building permits (excluding 100 permits per year for infill and 150 permits per year for affordable housing) until 2012 (M. McLean 2009a). The permit issuance limitations resulting from the passage of Measure A have resulted in the need for the city to update its General Plan, and the Tracy Hills Specific Plan.

Other development proposed near the project site include a variety of projects, such as the Mountain House mixed use development, and a number of commercial projects like the Costco Warehouse, Cordes Ranch Specific Plan, Gateway, Walmart, and Winco Grocery Store. Additionally, two institutional projects are planned in the vicinity of the proposed project: Kimball High School and Pastor of St. Bernard's Church (GWF2008a).

These new mixed use development projects with residential areas may have a potential cumulative impact on the existing industrial area adjacent to the GWF Tracy site. The potential cumulative impact would be a land use conflict between future residents' desire for quiet neighborhoods with no air pollution sources, versus the noise from established industrial operations, and legally permitted air emissions. Development of generous buffer zones between the new residential areas and the industrial area, including GWF Tracy, if approved, would diminish the potential for such a conflict. In addition, updates to the city of Tracy's planning documents resulting from the passage of Measure A will likely help in limiting the amount of development in the area.

GWF Tracy in combination with other proposed projects in the region are expected to contribute to a regional loss of open space and agricultural land. However, without mitigation in the form of open space and agricultural land preservation and land trusts, the project presents a significant cumulative impact on agricultural resources and open space.

To mitigate GWF Tracy's contribution to the cumulative loss of agricultural lands in the area, staff proposes Condition of Certification **LAND-1**. With implementation of **LAND-1**, staff believes the project's contribution to cumulative impacts would be mitigated to a less than significant level. Condition of Certification **LAND-1** would ensure that the GWF Tracy does not contribute to the loss of agricultural lands in the county.

RESPONSE TO COMMENTS

Written comments were provided on the contents of the PSA from agencies, organizations and members of the public. Comments related to specific issues

presented in the **LAND USE** section of the PSA are summarized below followed by a response. The applicant (GWF Energy, LLC) provided one minor comment on the **LAND USE** section, which staff has addressed.

Comment 1: GWF Energy, LLC (July 2009): Page 4.5-3, Other Project-Related Facilities. Transmission line Segment 1 no longer requires reconductoring (See General Comments).

Response: Text has been revised to address the comment from the applicant that indicates Segment 1 of the proposed transmission line no longer requires reconductoring.

CONCLUSIONS AND RECOMMENDATIONS

- GWF Tracy, with implementation of staff's proposed Conditions of Certification **LAND-1,** would be consistent with the applicable LORS pertaining to local land use planning and would not generate a significant impact under the California Environmental Quality Act (CEQA) guidelines.
- The proposed project would result in the permanent conversion of 3.28 acres of agricultural land to a non-agricultural use (i.e., a power generation facility), which represents a significant impact. Therefore, staff recommends Condition of Certification **LAND-1,** which requires the project owner to mitigate for the conversion of 3.28 acres of agricultural land to non-agricultural use.
- The proposed project is consistent with the San Joaquin General Plan and Development Title as a permitted use, subject to approval (but for the exclusive authority of the Energy Commission). Staff is proposing Condition of Certification **LAND-1** to ensure that the project is constructed and operated in accordance with the county's goals and policies.
- The proposed project would not disrupt or divide the physical arrangement of an established community.
- The proposed GWF Tracy would not result in any physical incompatibilities with existing on-site or nearby uses.
- With the implementation of Condition of Certification **LAND-1, t**he proposed project's contribution to the overall significant cumulative land use impacts in the project area would be less than significant.

If the Energy Commission approves the project, staff is proposing Condition of Certification **LAND-1** to ensure that the proposed project mitigates for the permanent conversion of 3.28 acres agricultural lands to a non-agricultural use.

PROPOSED CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall mitigate for the loss of 3.28 acres of Prime Farmland , as defined by the California Agricultural Land Evaluation and Site Assessment (LESA) Model (DOC 1997), at a level not to exceed a one-to-one ratio.. The farmland acreage conversion requiring mitigation as a result of

GWF Tracy is in addition to the 13.1 acres of Prime Farmland converted as a result of the Tracy Peaker Project (TPP) (see TPP Condition of Certification LAND-2)**.**

Verification: The project owner shall provide a mitigation fee payment to an agricultural land trust such as the American Farmland Trust or any other land trust that has been previously approved by the Compliance Project Manager (CPM) at least 120 days prior to the start of construction. The fee payment will be determined by an independent appraisal conducted on available, comparable, farmland property on behalf of the agricultural land trust. The project owner shall pay all costs associated with the appraisal. The project owner shall provide documentation to the CPM that the fee has been paid and that the 3.28 acres of additional farmland and/or easements have been purchased within three years of start of operation as compensation for the 3.28 acres of agricultural land to be converted by GWF. The documentation also shall guarantee that the land/easements purchased by the trust will be located in San Joaquin County and will be farmed in perpetuity. If no available land or easements can be purchased in San Joaquin County, then the purchase of lands/easements in other Central Valley Counties is acceptable. The project owner shall provide to the CPM updates in the Annual Compliance Report on the status of farmland/easement purchase(s).

REFERENCES

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M. McLean 2009a. M. McLean Report of Conversation (ROC) between M. McLean and City Of Tracy Planning Department Director, dated 7/21/2009. Submitted to CEC/Docket Unit on 7/23/2009.

APPENDIX LU-1
GWF TRACY COMBINED CYCLE POWER PLANT PROJECT
SITE LESA MODEL WORKSHEETS

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Land Evaluation Worksheet
Land Capability Classification (LCC) and Storie Index Scores

A	B	C	D	E	F	G	H
Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
118	1.64	0.5	II	80	40	44	22
252	1.64	0.5	II	80	40	68	34
Totals	**3.28**	**1.00**		***LCC Total Score***	**80.00**	***Storie Index Total Score***	**56.00**

(Must Sum To 1.0)

Site Assessment Worksheet 1.
Project Size Score

	I	J	K
	LCC Class I - II	LCC Class III	LCC Class IV- VIII
	1.64		
	1.64		
Total Acres	**3.28**		
Project Size Scores	**0**		
Highest Project Size Score	**0**		

Site Assessment Worksheet 2.
Water Resource Availability

A	B	C	D	E
Project Portion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score (C x D)
1	Irrigated	1	100	100
2				
3				
4				
5				
6				
		1.00	***Total Water Resource Score***	**100.00**
		(Must Sum to 1.0)		

Surrounding Agricultural Land and Surrounding Protected Resource Land

A	B	C	D	E	F	G
Zone of Influence					Surrounding Agricultural Land Score (from table on page A-7)	Surrounding Protected Resource Land Score (from table on page A-8)
Total Acres	Acres in Agriculture	Acres of Protected Resource Land	Percent in Agriculture (B/A)	Percent Protected Resource Land (C/A)		
288	236	96	82	33	95	20

Final LESA Score Sheet

Calculation of the Final LESA Score

(1) Multiply each factor score by the factor weight to determine the weighted score and enter in Weighted Factor Scores column.
(2) Sum the weighted factor scores for the LE factors to determine the total LE score for the project.
(3) Sum the weighted factor scores for the SA factors to determine the total SA score for the project.
(4) Sum the total LE and SA scores to determine the Final LESA Score for the project.

		Factor Scores	Factor Weight	Weighted Factor Scores
LE Factors				
Land Capability Classification (see page A-2)	<1>	80	0.25	20
Storie Index Rating (see page A-2)	<2>	56	0.25	14
LE Subtotal			**0.50**	**34**
SA Factors				
Project Size (see page A-2)	<3>	0	0.15	0
Water Resource Availability (see page A-5)	<4>	100	0.15	15
Surrounding Agricultural Land (see page A-9)	<5>	95	0.15	14.25
Surrounding Protected Resource Land (see page A-9)	<6>	20	0.05	1
SA Subtotal			**0.50**	**30.25**
			Final LESA Score	**64.25**

NOISE AND VIBRATION

Testimony of Steve Baker

SUMMARY OF CONCLUSIONS

California Energy Commission staff concludes that the GWF Tracy Combined Cycle Power Plant can be built and operated in compliance with all applicable noise and vibration laws, ordinances, regulations, and standards and, if built in accordance with the conditions of certification proposed below, would produce no significant adverse noise impacts on sensitive receptors within the affected area, either direct or cumulative.

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances and whether it would 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 groundborne 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 GWF Tracy Combined Cycle Power Plant (GWF Tracy) 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), and to avoid creation of significant adverse noise or vibration impacts. For an explanation of technical terms and acronyms employed in this section, please refer to **NOISE APPENDIX A** immediately following.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Noise Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
(OSHA): 29 U.S.C. § 651 et seq.	Protects workers from the effects of occupational noise exposure
State	
(Cal/OSHA): Cal. Code Regs., tit. 8, §§ 5095-5099	Protects workers from the effects of occupational noise exposure
Local	
San Joaquin County Ordinance Code, § 9-1025.9	Limits noise from stationary sources to 45 dBA L_{eq} nighttime, 50 dBA L_{eq} daytime at residences

FEDERAL

Under the Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations designed to protect workers against the effects of occupational noise exposure (29 CFR § 1910.95). 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 only guidance available for evaluation of power plant vibration is guidelines published by the Federal Transit Administration (FTA) for assessing the impacts of groundborne vibration associated with construction of rail projects. These guidelines have been applied by other jurisdictions to assess groundborne vibration of 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 groundborne vibration. The FTA measure of the threshold of perception is 65 VdB,[1] 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

[1] VdB is the common measure of vibration energy.

guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure.

The California Occupational Safety and Health Administration (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 the **WORKER SAFETY AND FIRE PROTECTION** section of this document and **Noise Appendix A Table A4**).

LOCAL

San Joaquin County Ordinance Code

Title 9 of the San Joaquin County Ordinance Code sets various Performance Standards; section 9-1025.5 addresses Vibration, and section 9-1025-9 addresses Noise (SJC 1995).

Section 9-1025.5 sets limits on the maximum displacement (intensity) of vibration permissible, but subsection (c) exempts vibration caused by construction or demolition work.

Section 9-1025.9(b)(2) requires new stationary noise sources to mitigate noise emissions so as not to exceed the noise level standards in Table 9-1025.9, Part II; this table is reproduced here as **Noise Table 2**.

Noise Table 2
Maximum Allowable Noise Exposure: Stationary Noise Sources

	Daytime (7 a.m. to 10 p.m.)	**Nighttime (10 p.m. to 7 a.m.)**
Hourly Equivalent Sound Level (L_{eq}), dB	50	45
Maximum Sound Level (L_{max}), dB	70	65

Source: SJC 1995, Table 9-1025.9, Part II

Section 9-1025.9(c)(3) exempts from these limits any construction noise, provided it does not take place before 6:00 a.m. or after 9:00 p.m.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified and that such impacts be eliminated or mitigated to the extent feasible. 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:

1. Exposure of persons to, or generation of, noise levels in excess of standards established in the local General Plan or noise ordinance or applicable standards of other agencies;

2. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

3. Substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

4. 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 3 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 5 dBA or more at the nearest sensitive receptor, including those receptors that are considered minority population.

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 considered 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 the case.

Factors to be considered in determining the significance of an adverse impact as defined above include:

1. The resulting combined noise level;[2]

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

5. Public concern or controversy as demonstrated at workshops or hearings or by correspondence.

[2] 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.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

- The construction activity is temporary;
- Use of heavy equipment and noisy activities is limited to daytime hours; and
- All industry-standard noise abatement measures are implemented for noise-producing equipment.

Staff uses the above method and threshold to protect the most sensitive populations, including the minority population.

SETTING

The project consists of a modification to the existing Tracy Peaker Project (TPP) (01-AFC-16), certified by the Energy Commission in 2002. The TPP is a 169-MW peaker plant consisting of two General Electric Frame 7EA gas turbine generators; GWF Tracy would convert this into a two-on-one combined cycle plant by replacing the selective catalytic reduction (SCR) units with heat recovery steam generators (HRSGs) and adding a 145-MW steam turbine generator, air-cooled condenser (ACC), auxiliary boiler, and related facilities. No off-site changes would be necessary to linear facilities (water supply and natural gas fuel supply) other than minor modifications to the transmission interconnection (GWF 2008a, AFC §§ 1.1, 2.2.1, 2.2.2, 2.2.7.2, 2.4.3).

GWF Tracy would be constructed on 16.38 acres within the existing 40-acre parcel that comprises the TPP, immediately southwest of the City of Tracy. The Delta-Mendota Canal lies to the southwest, agricultural lands to the south and east, and the Union Pacific Railroad to the north. North of the railroad are the Owens-Brockway glass container manufacturing plant and a warehouse operation; a biomass power plant lies approximately 0.6 miles to the northwest. Surrounding land uses are agricultural and industrial, with some residential (GWF 2008a, AFC §§ 1.1, 1.2, 2.2.1, 5.7.4).

The ambient noise regime in the project vicinity consists chiefly of traffic on Interstate 580 (I-580) and the industrial and agricultural activities described above (GWF 2008a, AFC § 5.7.4; App. 5.7A). The nearest sensitive noise receptors are three residences: one approximately 2,600 feet west (referred to as LT-2), one approximately 2,600 feet southwest (referred to as ST-5), and one approximately 3,800 feet east (referred to as LT-1) (GWF 2008a, AFC § 5.7.4). In the following analysis, LT-1 need not be considered because, due to its greater distance from the project site, noise impacts at LT-1 will be less than at the nearer receptors.

Ambient Noise Monitoring

In order to establish a baseline for comparison of predicted project noise to existing ambient noise, GWF Energy LLC (GWF) has presented the results of an ambient noise survey (GWF 2008a, AFC § 5.7.4.1; Tables 5.7-4, 5.7-5; App. 5.7A). The survey was performed May 19 through May 21, 2003, as required by the Energy Commission Decision for the TPP. This monitoring was performed with the TPP operating; its purpose was to demonstrate that the TPP's noise did not exceed the limits specified in

the Decision. The survey results remain valid because the ambient noise environment at the TPP and the sensitive receptors has not changed in the intervening years.

The noise survey monitored existing noise levels at the following locations, shown on **Noise and Vibration Figure 1**:

1. Measuring Location LT-2 (Lopez residence): A single residence approximately 2,600 feet (one-half mile) west of the center of the site. This represents one of the nearest sensitive receptors, most likely to be impacted by project noise. Long-term (46-hour) monitoring showed ambient noise sources were chiefly traffic on I-580 and noise from industrial operations. The TPP was inaudible at this location, even though the plant was operating at full output.

2. Measuring Location ST-5 (Timmons residence): A single residence approximately 2,600 feet (one-half mile) southwest of the center of the site. This represents the remaining nearest sensitive receptor. Monitoring was conducted for 46 consecutive hours and showed ambient noise sources to be chiefly traffic noise from I-580. The TPP was also inaudible at this location.

Noise Table 3 summarizes these ambient noise measurements (GWF 2008a, AFC Tables 5.7-4 and 5.7-5).

Noise Table 3
Summary of Measured Ambient Noise Levels

Measurement Location	Measured Noise Levels, dBA		
	L_{eq} – Daytime[1]	L_{eq} – Nighttime[2]	L_{90} - Nighttime
LT-2 – Lopez residence, 0.5 mile W	58.2	58.2	45.9
ST-5 – Timmons residence, 0.5 mile SW	46.3	48.8	42.1

Source: GWF 2008a, AFC Tables 5.7-4, 5.7-5
[1] Staff calculations of average of 15 daytime hours (from noon to 10 p.m. 5/20/03 and from 7 a.m. to noon 5/21/03)
[2] Staff calculations of average of nine nighttime hours (from 10 p.m. 5/20/03 to 7 a.m. 5/21/03)
[3] Staff calculations of average of four consecutive quietest hours of the nighttime (LT-2, 11 p.m. 5/20/03 to 3 a.m. 5/21/03; ST-5, 10 p.m. 5/20/03 to 2 a.m. 5/21/03)

DIRECT IMPACTS AND MITIGATION

Noise impacts associated with the project can be created by short-term construction activities and by normal long-term operation of the power plant.

Construction Impacts and Mitigation

Construction noise is usually considered a temporary phenomenon. Construction of GWF Tracy is expected to last 22 months, typical of other combined cycle power plants in terms of schedule, equipment used, and other types of activities (GWF 2008a, AFC § 2.2.1.4).

Compliance with LORS

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 San Joaquin County Ordinance Code restricts noisy construction to the hours between 6:00 a.m. and 9:00 p.m. GWF commits to limiting construction to these hours (GWF 2008a, AFC § 5.7.5.2.2). Adhering to these specified hours of construction would yield compliance with the applicable LORS. Energy Commission staff proposes Condition of Certification **NOISE-6**, below, to ensure compliance.

CEQA Impacts

Power Plant Site

To evaluate construction noise impacts, staff compares the projected noise levels to the ambient. Since construction noise typically varies continually with time, it is most appropriately measured by, and compared to, the L_{eq} (energy average) metric.

Aggregate construction noise can be expected to reach levels of 54 dBA L_{eq} at the residences at LT-2 and ST-5 (GWF 2008a, AFC Table 5.7-7 and staff calculations). Comparing projected noise levels to the ambient noise levels at LT-2 (see **Noise Table 4**, below) shows an increase during daytime of 1 dBA. Such an increase is unnoticeable and is considered insignificant. The increase over nighttime ambient noise levels would likewise be approximately 1 dBA, an unnoticeable increase even at night, when people are sleeping. At ST-5, however, the lower ambient noise levels make construction noise more noticeable. **Noise Table 4** shows an increase during daytime of 9 dBA, a clearly noticeable increase. As described above, staff considers an increase between 5 and 10 dBA to constitute an adverse impact, but not necessarily a significant one. **Noise Table 4** shows an increase during nighttime of 6 dBA, again an adverse impact but not necessarily significant.

Noise Table 4
Predicted Power Plant Construction Noise Impacts

Receptor	Average Construction Noise Level[1] (dBA L_{eq})	Measured Existing Ambient[2] (dBA L_{eq})	Cumulative (dBA L_{eq})	Change (dBA)
LT-2 — Nearest residence to W	54	58 daytime	59 daytime	+1 daytime
		58 nighttime	59 nighttime	+1 nighttime
ST-5 — Nearest residence to SW	54	46 daytime	55 daytime	+9 daytime
		49 nighttime	55 nighttime	+6 nighttime

1 Source: GWF 2008a, AFC Table 5.7-7
2 Source: GWF 2008a, AFC Tables 5.7-4 and 5.7-5; and staff calculations of average of daytime and nighttime hours

Ambient noise levels at both LT-2 and ST-5 are relatively high; this is not a quiet neighborhood. An increase of 9 dBA during daytime would likely not be annoying; even

a 6 dBA increase at night may not cause annoyance. In fact, GWF points out that no noise complaints were received during construction of the TPP (GWF 2008a, AFC § 5.7.5.2.2). In light of the noisy ambient regime and the history of no complaints, staff believes that noise impacts from normal project construction would not constitute a significant adverse impact at either sensitive receptor.

As described above, GWF commits to limiting noisy construction work to daytime hours. In order to avoid annoyance, staff proposes such a limit. Proposed Condition of Certification **NOISE-6**, below, would restrict noisy construction to the hours between 6:00 a.m. and 9:00 p.m.

In the event that actual construction noise should annoy nearby residents, staff proposes Conditions of Certification **NOISE-1** and **NOISE-2**, which would establish a Notification Process to make nearby residents aware of the project, and a Noise Complaint Process that requires GWF to resolve any problems caused by noise from the project.

Linear Facilities

No new off-site linear facilities would be required; only the transmission interconnection would require reconductoring and the addition of two new poles (GWF 2008a, AFC §§ 1.1, 2.1). Construction of linears moves along rapidly, so no area is exposed to noise for more than a few days, and reconductoring is typically not a noisy operation. Limiting noisy construction to daytime hours should provide adequate mitigation of impacts. To ensure compliance with this restriction, staff proposes Condition of Certification **NOISE-6**.

Pile Driving

GWF has not yet determined whether pile driving would be necessary for construction of GWF Tracy. Were pile driving required, the noise from this operation could be expected to reach 74 dBA at a distance of 3,000 feet (GWF 2008a, AFC § 5.7.5.2.3; Table 5.7-8). Pile driving noise would thus be projected to reach 69 dBA at LT-2 and ST-5, the nearest residential receptors (staff calculation). Added to the existing daytime ambient level of 58 dBA L_{eq} at LT-2, this would combine to produce 69 dBA, an increase of 11 dBA over the ambient level (see **Noise Table 5** below). Similarly, added to the existing daytime ambient level of 46 dBA L_{eq} at ST-5, this would combine to produce 69 dBA, an increase of 23 dBA over the ambient level. While this would produce a noticeable impact, staff believes that limiting pile driving to daytime hours, in conjunction with its temporary nature, would result in impacts that are tolerable to residents. Staff proposes Condition of Certification **NOISE-6** to ensure that pile driving noise, should it occur, is limited to the daytime hours.

Noise Table 5
Pile Driving Noise Impacts

Receptor	Pile Driving Noise Level (dBA L_{eq})	Daytime Ambient Noise Level (dBA L_{eq})	Cumulative Level (dBA)	Change (dBA)
LT-2	69	58	69	+11
ST-5	69	46	69	+23

Source: GWF 2008a, AFC Tables 5.7-4, 5.7-5, 5.7-8; and staff calculations

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 “high-pressure 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 lines are connected to the steam turbine, which is then ready for operation. Alternatively, high-pressure compressed air can be substituted for steam.

High-pressure steam blows, if unsilenced, can typically produce noise levels as high as 129 dBA at a distance of 50 feet; this would amount to roughly 95 dBA at LT-2 and ST-5, the nearest sensitive receptors. With a silencer installed on the steam blow piping, noise levels are commonly attenuated to 89 dBA at 50 feet; this would yield approximately 55 dBA at LT-2 and ST-5.

Although no LORS would prohibit the noise from an unsilenced high-pressure steam blow, the San Joaquin County Ordinance Code limits such noisy construction work to the hours between 6 a.m. and 9 p.m. This level of noise, however, would likely be extremely annoying at LT-2 and ST-5, even during the daytime. A silenced blow would not be annoying and, in fact, would likely be unnoticeable compared to the daytime ambient noise level at LT-2, and would not be annoying at ST-5 (see **Noise Table 6** below).

A newer, quieter steam blow process, referred to as low-pressure steam blow and marketed under names such as QuietBlow™ or Silentsteam™, has become popular. This method utilizes lower pressure steam or compressed air over a continuous period of 36 hours or so. Resulting noise levels reach about 80 dBA at 100 feet; such a process would yield noise levels at LT-2 and ST-5 of approximately 52 dBA.

Staff compares the noise from a low-pressure steam blow to the nighttime ambient background (L_{90}) noise level because of the relatively constant nature of the steam blow noise. Noise from a low-pressure continuous steam blow at LT-2 would cause an increase in ambient noise levels of 7 dBA, noticeable but likely tolerable by residents for the short duration of such a steam blow. Likewise, noise from a continuous steam blow at ST-5 would increase the nighttime ambient 10 dBA, also noticeable but likely tolerable. Staff believes a low-pressure continuous steam blow would not constitute a significant adverse impact.

Noise Table 6
Steam Blow Noise Impacts

Receptor	High-Pressure Steam Blow Noise Level (silenced) (dBA L_{eq})	Daytime Ambient Noise Level (dBA L_{eq})[1]	Cumulative Level (dBA L_{eq})	Change (dBA)
LT-2	55	58	60	+2
ST-5	55	46	56	+10
Receptor	**Low-Pressure Steam Blow Noise Level (dBA L_{eq})**	**Nighttime Ambient Noise Level (dBA L_{90})[1]**	**Cumulative Level (dBA L_{eq})**	**Change (dBA)**
LT-2	52	46	53	+7
ST-5	52	42	52	+10

[1] See **Noise Table 3**, above

In order to ensure that steam blow noise does not produce significant adverse impacts, staff has proposed Condition of Certification **NOISE-7** below.

Vibration

The only construction operation likely to produce vibration that could be perceived off-site would be pile driving, should it be employed. Vibration attenuates rapidly; it is likely that no vibration would be perceptible at any appreciable distance from the project site. Staff therefore believes there would be no significant impacts from construction vibration.

Worker Effects

GWF has acknowledged the need to protect construction workers from noise hazards and has recognized those applicable LORS that would protect construction workers (GWF 2008a, AFC § 5.7.5.2.1). To ensure that construction workers are, in fact, adequately protected, staff has proposed Condition of Certification **NOISE-3**.

Operation Impacts and Mitigation

The primary new noise sources of GWF Tracy include the heat recovery steam generators and their exhaust stacks, steam turbine, air cooled condenser with cooling fans, electrical transformer, auxiliary boiler, and various pumps and fans (GWF 2008a, AFC §§ 1.1, 2.1, 2.2.2). Staff compares the projected noise with applicable LORS. In

addition, staff evaluates any increase in noise levels at sensitive receptors due to the project in order to identify any significant adverse impacts.

GWF included the following noise mitigation measures in performing computer modeling of noise impacts from project operation (GWF 2008a, AFC § 5.7.5.3.2):

- HRSG stack silencers;
- Steam turbine equipment enclosure; and
- Air-cooled condenser noise mitigation package, consisting of reduced-noise motors, gearboxes, and fan blades.

Compliance with LORS

GWF performed noise modeling to determine the project's noise impacts on sensitive receptors. Project operating noise at ST-5 (one of the nearest noise-sensitive residences, 0.5 mile southwest of the project site) is predicted to be approximately 42 dBA L_{eq} (GWF 2008a, AFC §§ 1.7.3, 5.7.5.3.2). This figure complies with the San Joaquin County Ordinance Code nighttime limit of 45 dBA L_{eq} (see **Noise Table 2** above). Since the residence at LT-2 is the same distance from the project site, staff believes project noise at LT-2 would be the same or very similar. This would result in compliance with LORS at LT-2.

Noise Table 7
Plant Operating Noise LORS Compliance

Receptor	LORS	LORS Limit	Projected Noise Level[1]
ST-5	San Joaquin County Ordinance Code	45 dBA L_{eq} nighttime 50 dBA L_{eq} daytime	42 dBA L_{eq}

[1] Source: GWF 2008a, AFC §§ 1.7.3, 5.7.5.3.2

CEQA Impacts

Power plant noise is unique. Essentially, a power plant operates as a steady, continuous, broadband 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 reduce or remove the impact.

In most cases, a power plant will be intended to operate around the clock for much of the year. GWF specifically states that GWF Tracy is intended to operate as a baseload plant, operating around the clock when called upon, up to 8,000 hours per year (GWF 2008a, AFC § 1.3). Staff evaluates project noise emissions by comparing them to the nighttime ambient background level; this assumes the potential for annoyance due to power plant noise is greatest at night when residents are trying to sleep. Nighttime ambient noise levels are typically lower than the daytime levels; differences of 5 to

10 dBA are common. Staff believes it is prudent to average the lowest nighttime hourly background noise level values to arrive at a reasonable baseline for comparison with the project's predicted noise level.

Power plant noise levels at ST-5 are predicted to reach 42 dBA L_{eq}; see **Noise Table 8**. Staff assumes that, since LT-2 lies equidistant from the site, plant noise levels at LT-2 will also reach 42 dBA.

Noise Table 8
Power Plant Noise Impacts at Nearest Sensitive Receptors

Receptor	Power Plant Noise Level, dBA L_{eq}[1]	Ambient Background Level, dBA L_{90}[2]	Cumulative Noise Level, dBA	Change from Ambient Background Level
LT-2	42	46	47	+1
ST-5	42	42	45	+3

[1] Source: GWF 2008a, AFC § 5.7.5.3.2. Staff assumes this figure is valid for LT-2 as well as ST-5
[2] Source: GWF 2008a, AFC Tables 5.7-4, 5.75-5; and staff calculations of average of four quietest consecutive nighttime hours

As explained above, when evaluating noise impacts on residences, staff compares project noise to the average of the four quietest consecutive nighttime hours. At LT2, this is the span from 11:00 p.m. to 3:00 a.m. (see AFC, Table 5.7-4). This value is 45.9 dBA L_{90} (see **Noise Table 8**). At ST-5, this is the span from 10:00 p.m. to 2:00 a.m. (see AFC, Table 5.7-5). This value is 42.1 dBA L_{90}.

When projected plant noise is added to the ambient value (as calculated by staff), the cumulative level is 1 dBA above the ambient value at LT-2 (see **Noise Table 8**) and 3 dBA above the ambient at ST-5. This increase is inaudible or barely noticeable and is below the range that staff considers a potentially significant adverse impact. To ensure this noise level is not further exceeded, staff proposes Condition of Certification **NOISE-4** below.

Tonal 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. GWF plans to avoid the creation of annoying tonal (pure-tone) noises by balancing the noise emissions of various power plant features during plant design (GWF 2008a, AFC § 5.7.5.3.3). To ensure that tonal noises do not cause annoyance, staff proposes Condition of Certification **NOISE-4**.

Linear Facilities

The only new linear facility proposed for GWF Tracy is an upgrade of the electrical interconnection. Noise effects from the electrical interconnection line typically do not extend beyond the right-of-way easement of the line and would thus be inaudible to any receptors (GWF 2008a, AFC § 5.7.5.3.5).

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 turbine generators, compressors, and various pumps. All of these pieces of equipment must be carefully balanced in order to operate; permanent vibration sensors are attached to the turbines and generators. Based on experience with numerous previous projects employing similar equipment, Energy Commission staff believes that groundborne vibration from GWF Tracy would 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. In staff's experience, airborne vibration impacts from a plant such as GWF Tracy are typically imperceptible 1,000 feet from the plant. GWF Tracy's chief source of airborne vibration would be the gas turbines' exhaust. In a power plant such as GWF Tracy, however, the exhaust must pass through the heat recovery steam generators (HRSGs) before it reaches the atmosphere. The HRSGs act as efficient mufflers; this makes it highly unlikely that GWF Tracy would cause perceptible airborne vibration effects.

Worker Effects

GWF has acknowledged the need to protect plant operating and maintenance workers from noise hazards and has committed to comply with applicable LORS (GWF 2008a, AFC § 5.7.5.3.1). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required. To ensure that plant operation and maintenance workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-5**.

CUMULATIVE IMPACTS AND MITIGATION

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.

GWF has identified no projects in the vicinity of GWF Tracy that may pose a potential for cumulative noise impacts (GWF 2008a, AFC § 5.7.6), and staff knows of none. Staff thus concludes that there is no likelihood of cumulative significant noise impacts.

FACILITY CLOSURE

In the future, upon closure of GWF Tracy, all operational noise from the project would cease, and no further adverse noise impacts from operation of GWF Tracy 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, 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.

AGENCY AND PUBLIC COMMENTS

The Tuso family submitted written comments that dealt, in part, with noise impacts of GWF Tracy (Tuso 2009a). Although the comments were not specific, GWF submitted a response (GWF 2009b) that included an isopleth diagram showing expected noise levels at Tuso family address (**Noise and Vibration Figure 2**, below). This diagram shows that expected noise levels from the operation of GWF Tracy will not exceed 34 dBA at any of this location. This is very quiet, and likely is less than the existing ambient noise levels at these locations. Noise from the project would thus be largely inaudible.

CONCLUSIONS AND RECOMMENDATIONS

GWF Tracy, if built and operated in conformance with these proposed conditions of certification, would comply with all applicable noise and vibration LORS for both operation and construction and would produce no significant adverse noise impacts on people within the affected area, directly, indirectly, or cumulatively.

PROPOSED CONDITIONS OF CERTIFICATION

The following proposed conditions differ from those in the Commission Decision on the Tracy Peaker Project in the following way:

- **NOISE-1**: The signed statement verifying notification of residents is to be submitted in the first Monthly Compliance Report, rather than as a separate document, in order to simplify compliance tracking.
- **NOISE-2** of the TPP Commission Decision: This condition is no longer required, as Conditions **NOISE-4** and **NOISE-6** provide the requisite protection. See the analysis on pages 4.6-6 to 4.6-7, above.
- **NOISE-4** (formerly **NOISE-5** of the TPP Decision): Permissible noise level at receptor LT-2 is changed from 39 dBA to 42 dBA; see the analysis on pages 4.6-10 to 4.6-11, above.
- **NOISE-6**: This ensures no noisy construction work will take place at night.
- **NOISE-7**: Steam blows were not a feature of the TPP, but would take place in the construction of GWF Tracy.

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 one-quarter mile of 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 and include that telephone number in the above-mentioned notice. 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 Compliance Project Manager (CPM) a statement, signed by the project owner's project manager, stating that the above-mentioned 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 GWF Tracy, 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 a 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;
- Take all feasible measures to reduce the noise at its source if the noise is project related; 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 CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a three-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 and a statement, signed by the project owner's project manager, verifying that the noise control program will be implemented throughout construction of the project. 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 and the project owner's project manager's signed statement. The project owner shall make the program available to Cal/OSHA upon request.

NOISE RESTRICTIONS

NOISE-4 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 solely to plant operation to exceed an average of 42 dBA L_{eq} measured at monitoring location LT-2, the residence located approximately 2,600 feet west of the project site. No new pure-tone components may be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.

The measurement of power plant noise for the purposes of demonstrating compliance with this condition of certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the affected residence. The character of the plant noise shall be evaluated at the affected residential locations to determine the presence of pure tones or other dominant sources of plant noise.

A. When the project first achieves a sustained output of 85 percent or greater of rated capacity, the project owner shall conduct a community noise survey at monitoring location LT-2 or at closer locations acceptable to the CPM. This survey shall be performed during power plant operation and shall also include measurement of one-third octave band sound pressure levels to determine whether new pure-tone noise components have been caused by the project.

B. If the results from the noise survey indicate that the power plant average noise level (L_{eq}) at LT-2 exceeds the above value, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

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's first achieving a sustained output of 85 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 limit 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-5 Following the project's first achieving a sustained output of 85 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 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-6 Heavy equipment operation and noisy construction work relating to any project features shall be restricted to the times of day delineated below:

Any Day	6:00 a.m. to 9:00 p.m.

Haul trucks and other engine-powered equipment shall be equipped with mufflers that meet all applicable regulations. 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.

STEAM BLOW RESTRICTIONS

NOISE-7 If a high-pressure steam blow 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 of 6:00 a.m. to 9:00 p.m.

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 from the steam or air blows alone will not exceed 52 dBA L_{eq} measured at the residence at LT-2.

Verification: At least 15 days prior to the first 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.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

GWF Tracy Combined Cycle Power Plant
(08-AFC-7)

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 three feet from noise source _____dBA Date: _____

Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at three 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

SJC 1995 — San Joaquin County Ordinance Code. 1995.

GWF2008a — GWF Energy LLC/D. Wheeler (tn: 47105). Application for Certification for GWF Tracy Combined Cycle Power Plant Project, dated 7/10/2008. Submitted to California Energy Commission Docket Unit on 7/18/2008.

GWF2009b - GWF Tracy / D. Wheeler (tn: 52542). Applicant's PSA Workshop Response to Public Comments, dated 7/23/2009. Submitted to CEC/Docket Unit on 7/23/2009.

Tuso2009a- Tuso (tn: 52430). Comments of the Tuso Family Presented at the June 23rd PSA Workshop, dated 7/7/2009. Submitted to CEC/Docket Unit on 7/15/2009.

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, those higher levels 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 would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about 7 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).

To help the reader understand the concept of noise in decibels (dBA), **Noise Table A2** illustrates 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 7:00 p.m. to 10:00 p.m., and after addition of 10 decibels to sound levels in the night between 10:00 p.m. and 7:00 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 10:00 p.m. and 7:00 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 1 dB cannot be perceived.

2. Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.

3. A change in level of at least 5 dB is required before any noticeable change in community response would be expected.

4. A 10-dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response (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 3-dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus 3 dB). **Noise Table A3** indicates the rules for decibel addition used in community noise prediction.

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 6 dB.

Increasing the distance from a noise source 10 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, as shown in **Noise Table A4**.

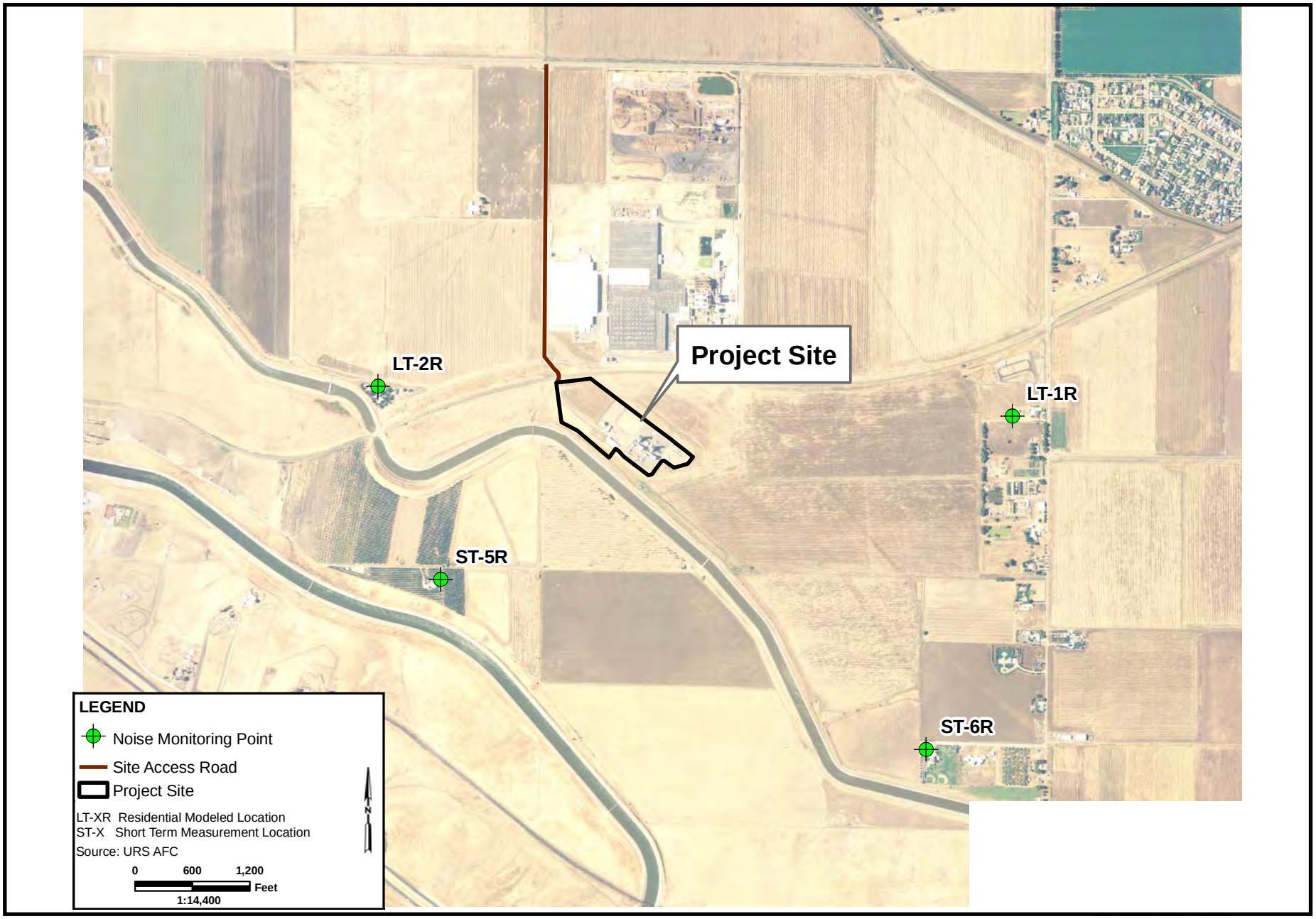
Noise Table A4
OSHA Worker Noise Exposure Standards

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 CFR §1910.95.

NOISE AND VIBRATION - FIGURE 1

GWF Tracy Project - Noise Monitoring Locations

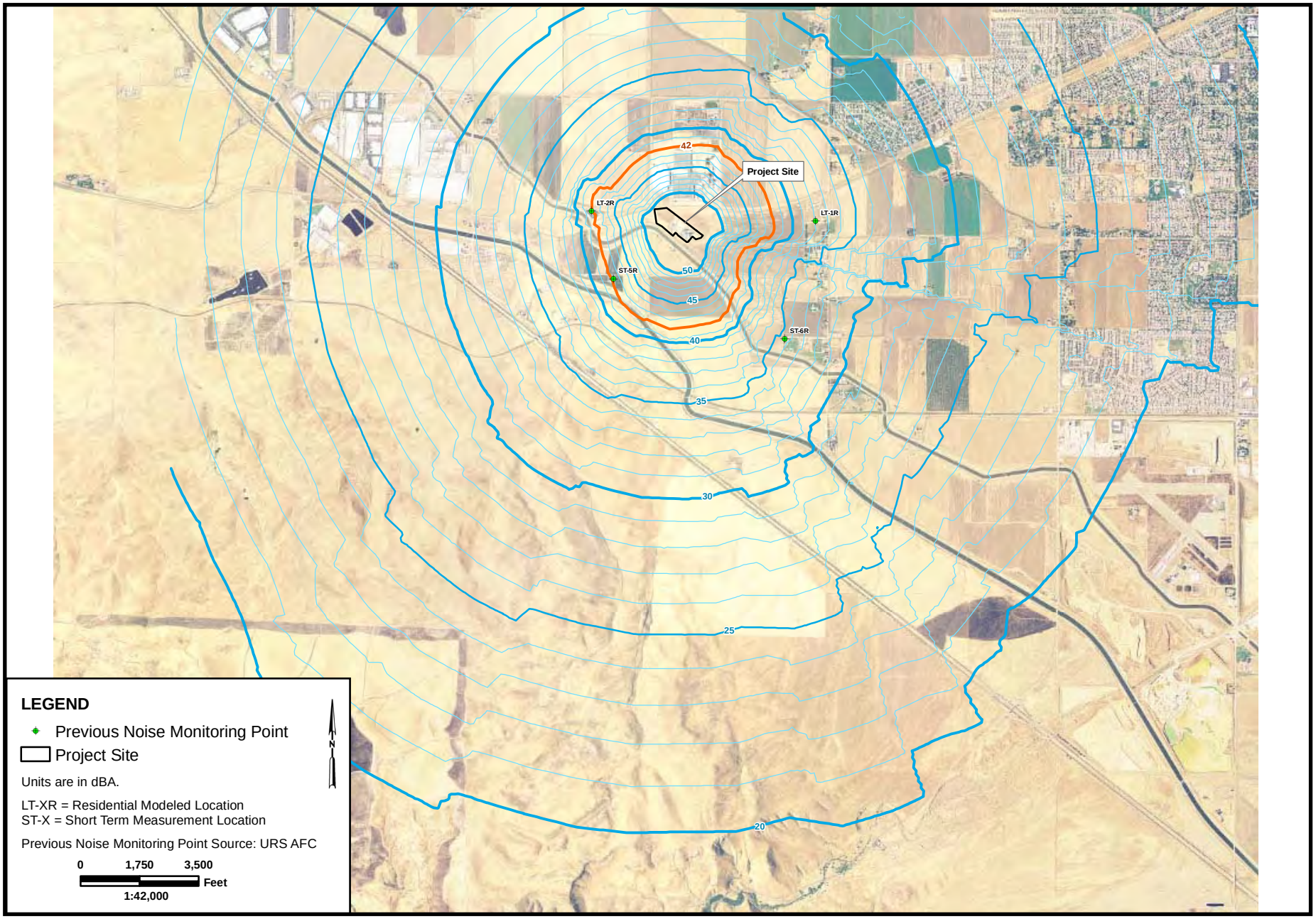


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, OCTOBER 2009

SOURCE: AFC Figure 5.7-1

NOISE AND VIBRATION - FIGURE 2

GWF Tracy Project - Expected Noise Levels



SOURCE: GWF 2009b

PUBLIC HEALTH

Testimony of Alvin J. Greenberg, Ph.D.

SUMMARY OF CONCLUSIONS

Staff has analyzed potential public health risks associated with construction and operation of the GWF Tracy Combined Cycle Power Plant (GWF Tracy) project and does not expect any significant adverse cancer or short- or long-term noncancer health effects from project toxic emissions. Staff's analysis of potential health impacts from the proposed GWF Tracy project uses a highly conservative methodology that accounts for impacts to the most sensitive individuals in a given population, including newborns and infants. According to the results of staff's health risk assessment, emissions from the GWF Tracy project would not contribute significantly to morbidity or mortality in any age or ethnic group residing in the project area.

INTRODUCTION

The purpose of this Final Staff Assessment (FSA) is to determine if emissions of toxic air contaminants (TACs) from the proposed GWF Tracy project 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.

California Energy Commission (Energy Commission) staff addresses potential impacts of regulated or criteria air pollutants in the **AIR QUALITY** section of this PSA, and 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 **SOIL AND WATER RESOURCES** section. Plant releases in the form of hazardous and nonhazardous wastes are described in the **WASTE MANAGEMENT** section.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Public Health Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Clean Air Act section 112 (Title 42, U.S. Code section 7412)	The National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires new sources that emit more than 10 tons per year of any specified Hazardous Air Pollutant (HAP) or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology.
State	
California Health and Safety Code section 25249.5 et seq. (Proposition 65)	These sections establish thresholds of exposure to carcinogenic substances above which Prop 65 exposure warnings are required.
California Health and Safety Code section 41700	This section 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 to business or property.”
California Code of Regulations, Title 22, section 60306	Requires that whenever a cooling system uses recycled water in conjunction with an air conditioning facility and a cooling tower that creates a mist that could come into contact with employees or members of the public, a drift eliminator shall be used and chlorine, or other, biocides shall be used to treat the cooling system recirculating water to minimize the growth of Legionella and other micro-organisms.
California Public Resource Code section 25523(a); Title 20 California Code of Regulations (CCR) section 1752.5, 2300–2309 and Division 2 Chapter 5, Article 1, Appendix B, Part (1); California Clean Air Act, Health and Safety Code section 39650, et seq.	These regulations require a quantitative health risk assessment for new or modified sources, including power plants that emit one or more toxic air contaminants (TACs).
Local	
SJVAPCD Rule 7012	This rule limits the emissions of hexavalent chromium from cooling towers and prohibits the use of products containing these compounds for treatment of cooling tower water.

SETTING

This section describes the environment in the vicinity of the proposed project site from the public health perspective. Characteristics 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, affect public exposure to project emissions. Additional factors affecting potential public health impacts include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The project would be located at the site of the existing Tracy Peaker Plant (TPP), in the City of Tracy, California. Land in the vicinity of the proposed project is designated for rural residential, agricultural, industrial and commercial uses (GWF 2008a, Section 5.6.4.1.1). Natural gas would be delivered by the Pacific Gas and Electric Company (PG&E) via an existing gas pipeline that currently supplies the TPP (GWF Tracy 2008a, Section 4.1). Sensitive receptors within a six-mile radius are listed in Appendix 5.5A and mapped in Figures 5.5-1a and 5.5-1b of the AFC (GWF Tracy 2008a). The nearest sensitive receptor is the George Kelly Elementary School, located approximately 1.5 miles northeast of the project site (GWF Tracy 2008a, Section 5.5.3). Also, the Tracy Unified School District is expected to complete the construction of the John C. Kimball High School for fall 2009 enrollment. The high school is located at 3200 Jaguar Run, Tracy, California and is approximately 1.7 miles from the project site. The nearest residence is located about 0.4 miles west, and the nearest public receptors are workers at two businesses located immediately beyond the railroad, north of the project site (GWF Tracy 2008a, Section 5.9.3).

The two stacks proposed for the GWF Tracy project would be 150 feet high (GWF Tracy 2008a, Section 2.1). The location of elevated terrain (above the stack height) is important in assessing potential exposure, as an emission plume may impact high elevations before impacting lower elevations. The site's elevation is about 175 feet above sea level, and the topography of the immediate vicinity is generally flat. Terrain above stack height exists in a region running northwest to southwest about one mile west of the proposed site (GWF 2008a, Section 5.1.1.1).

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, a semi-permanent, subtropical high-pressure system

located off the west coast of the United States (GWF Tracy 2008a, Section 5.1.1.2). 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. The majority of the region's annual rainfall occurs between December 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 through which the air is well mixed and in which pollutants can be dispersed) are lower during mornings due to temperature inversions and increase during the warmer afternoons. Staff's **AIR QUALITY** section presents more detailed meteorological data.

EXISTING AIR QUALITY

The proposed site is within the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). By examining average toxic concentration levels from representative air monitoring sites with cancer risk factors specific to each contaminant, lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air. For comparison purposes, it should be noted that the overall lifetime cancer risk for the average individual in the United States is about 1 in 3, or 333,000 in 1 million.

The air monitoring site closest to the project is the Tracy Boulevard monitoring station, located approximately 4.5 miles northeast. This station was constructed in 2005 to replace the Patterson Road monitoring station which was located about 2.0 miles northwest of the project site. Air quality data collected at both of these stations and several others in the region show that annual PM10 levels range between 20 $\mu g/m^3$ and 30 $\mu g/m^3$ while annual PM2.5 levels range between 12.5 $\mu g/m^3$ and 13.5 $\mu g/m^3$ (GWF Tracy 2008a, Section 5.1.3 and Table 5.1-3). This station does not include monitoring for toxic air contaminants (TACs). The nearest air monitoring site for TACs is located in Stockton and is operated by the ARB. Total background inhalation cancer risk based on the data collected at this regional monitoring station is not presented. However, the nearby Bay Area Air Quality Management District does report an overall background inhalation cancer risk for the nine Bay Area Counties. In 1992, cancer risk was 342 in 1 million, 315 in 1 million in 1994, 303 in 1 million in 1995, and in 2003, the most recent year for which data is available, the average inhalation cancer risk decreased to 142 in 1 million (BAAQMD 2007).

EXISTING PUBLIC HEALTH CONCERNS

According to the applicant, no health studies were identified within a 6-mile radius of the project site or within San Joaquin County (GWF Tracy 2008a, Section 5.9.3).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

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 ambient air quality standards have been established are called noncriteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, noncriteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone.

Since noncriteria pollutants do not have such standards, a health risk assessment is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The risk assessment consists of the following steps:

- Identify the types and amounts of hazardous substances that the GWF Tracy project could emit to the environment;
- Estimate worst-case concentrations of project emissions in the environment using dispersion modeling;
- Estimate amounts of pollutants that people could be exposed to through inhalation, ingestion, and dermal contact; and
- Characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Staff relies upon the expertise of the California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) to identify contaminants that are known to the state to cause cancer or other noncancer toxicological endpoints and to calculate the toxicity and cancer potency factors of these contaminants. Staff also relies upon the expertise of the California Air Resources Board and the local air districts to conduct ambient air monitoring of toxic air contaminants and the state Department of Public Health to conduct epidemiological investigations into the impacts of pollutants on communities. It is not within the purview or the expertise of the Energy Commission staff to duplicate the expertise and statutory responsibility of these agencies.

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 as estimated by the screening level assessment. The risks for screening purposes are based on examining conditions that would lead to the highest, or worst-case, risks and then using those conditions 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 estimated to be the highest;
- Assuming that an individual's exposure to cancer-causing agents occurs continuously for 70 years; and
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses).

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 that could present a health hazard from noninhalation pathways of exposure (OEHHA 2003, Tables 5.1, 6.3, 7.1). 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 (OEHHA 2003, p. 5-3).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) noncancer 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 that arise as a result of long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from 12-100% of a lifetime, or from 8 to 70 years (OEHHA 2003, p. 6-5). 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 (OEHHA 2003, p. 6-2). 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 Reference Exposure Levels 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 conformity with the California Air Pollution Control Officers Association (CAPCOA) guidelines, the health risk assessment assumes that the effects of each substance are additive for a given organ system (OEHHA 2003, pp. 1-5, 8-12). Other possible mechanisms due to multiple exposures include those cases where the actions may be synergistic or antagonistic (where the effects are greater or less than the sum, respectively). For these types of substances, the health risk assessment could underestimate or overestimate the risks.

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 OEHHA), 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 due to project emissions 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

Energy 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, noncriteria pollutants are evaluated for short-term (acute) and long-term (chronic) noncancer health effects, as well as cancer (long-term) health effects. The 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 noncancer 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 1.0 signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance that 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 1.0 indicates that cumulative worst-case exposures are less than the reference exposure levels. Under these conditions, health protection from the project is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant noncancer 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 10 in 1 million, which is also written as 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 applied by Proposition 65. The significant risk level of 10 in 1 million is consistent with the level of significance adopted by many air districts. In general, these air districts would not approve a project with a cancer risk exceeding 10 in 1 million. The SJVAPCD also uses 10 in 1 million as the level of "Significant Health Risk".

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. Staff's analysis also addresses potential impacts on all members of the population including the young, the elderly, people with existing medical conditions that may make them more sensitive to the adverse effects of toxic air contaminants, and any minority or low-income populations that are likely to be disproportionately affected by impacts. To accomplish this goal, staff uses the most current acceptable public health exposure levels (both acute and chronic) set to protect the public from the effects of airborne toxics. 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. Based on refined assumptions, if risk posed by the facility exceeds the significance level of 10 in 1 million, staff would require appropriate measures to reduce the risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than 10 in 1 million, staff would deem such risk to be significant and would not recommend project approval.

DIRECT/INDIRECT IMPACTS AND MITIGATION

CONSTRUCTION IMPACTS AND MITIGATION

Potential risks to public health during demolition and construction may be associated with exposure to toxic substances in contaminated soil disturbed during site preparation, as well as diesel exhaust from heavy equipment operation. Criteria pollutant impacts from the operation of heavy equipment and particulate matter from earth moving are examined in staff's **AIR QUALITY** analysis.

Site disturbances occur during facility construction from excavation, grading, and earth moving. Such activities have the potential to adversely affect public health through various mechanisms, such as the creation of airborne dust, material being carried off site through soil erosion, and uncovering buried hazardous substances. The Phase I Environmental Site Assessment conducted for the original TPP site in 2001 identified no "Recognized Environmental Conditions" per the American Society for Testing and Materials Standards (ASTM) definition (GWF Tracy 2008a, Section 5.14.3.1.1). That is, there was no evidence or record of any use, spillage or disposal of hazardous substances on the site, nor any other environmental concern that would require remedial action. The GWF Tracy project is located entirely within the 40-acre parcel surveyed for the Phase I ESA and includes either land within the TPP site or land that was previously disturbed during construction of the TPP facility (GWF Tracy 2008a, Section 5.14.3.1). In the unlikely event that unexpected contamination is encountered during construction of the GWF Tracy project, proposed Conditions of Certification **WASTE-1** and **WASTE-2** require a registered professional engineer or geologist to be available during soil excavation and grading to ensure proper handling and disposal of contaminated soil. See the staff assessment section on **WASTE MANAGEMENT** for a more detailed analysis of this topic.

The operation of construction equipment will result in air emissions from diesel-fueled engines. Diesel emissions are generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Although diesel exhaust contains criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides, it also includes a complex mixture of thousands of gases and fine particles. These particles are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust contains over 40 substances that are listed by the U.S. Environmental Protection Agency (U.S. EPA) as hazardous air pollutants and by the California Air Resources Board (ARB) as toxic air contaminants.

Exposure to diesel exhaust may cause both short- and long-term adverse health effects. Short-term effects can include increased coughing, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer.

Based on a number of health effects studies, the Scientific Review Panel on Toxic Air Contaminants recommended a chronic reference exposure level (see discussion of reference exposure levels in Method of Analysis section above) for diesel exhaust particulate matter (DPM) of 5 micrograms of diesel particulate matter per cubic meter of air ($\mu g/m^3$) and a cancer unit risk factor of $3x10^{-4}$ $(\mu g/m^3)^{-1}$ (SRP 1998, p. 6). The Scientific Review Panel did not recommend a value for an acute Reference Exposure Level since available data in support of a value was deemed insufficient. On August 27, 1998, ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved the panel's recommendations regarding health effect levels.

Appendix 5.1A and Table 5.1-4 of the AFC (GWF Tracy 2008a) present the maximum annual on-site construction emissions from fugitive dust and equipment exhaust as well

as offsite vehicle emissions (called the point of maximum impact or PMI). The total maximum annual emissions estimated by the applicant are 2.1 tons per year of particulate matter 10 (PM10) and 0.96 tons per year of PM2.5. The applicant has stated that due to the short duration of construction for this project (about 22 months including demolition), an assessment of health risks from construction emissions is not required by the SJVAPCD and therefore was not performed by the applicant (GWF Tracy 2008a, Section 5.9.4.3). As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from 8 to 70 years.

Staff, however, conducted its own assessment of impacts to public health due to DPM emissions during the construction phase. Atmospheric dispersion modeling of DPM emissions from construction equipment was conducted. Staff assumed that all PM2.5 emitted from construction equipment and vehicles would be DPM. The HARP model and screening meteorological data were used and emissions were modeled as a volume source (with vertical dimension of 20 feet, horizontal dimension of 328 feet and release height of 6 feet). The construction phase of this project is expected to last 22 months.

The maximum predicted offsite concentrations of DPM are 0.47 ug/m^3 located just outside the southern fenceline (staff's PMI) and 0.39 ug/m^3 at the applicant's location of the PMI. Table 5.1-15 of the AFC lists the maximum modeled concentration for PM2.5 to be 0.43 ug/m^3, but the location of this is not specified. In Staff's analysis, cancer risk due to diesel emissions was determined using HARP and adjusted by the exposure duration of 22 months of a 70 year lifetime (22 months/840 months = 0.026). Cancer risk at the location of the maximum offsite concentration was determined to be 5 in a million and at the location of the PMI, to be 4 in a million. The procedure, assumptions, and results of this analysis are presented in **Public Health Table 2**.

Public Health Table 2
Staff's Analysis of Construction Equipment Diesel Emissions and Risks

Total estimated PM2.5 emissions during construction period (22 months):	2,347 lb
Annual PM2.5 emissions during construction period:	1,280 lb/yr
Maximum PM2.5 concentration off-site:	0.47 ug/m^3
Risk at location of maximum concentration:	5.1 in a million
PM2.5 concentration at PMI:	0.39 ug/m^3
Risk at location of PMI:	4.2 in a million

Since all airborne levels predicted by staff are below the chronic REL and the level of significant risk, staff concludes that no significant health impacts are expected from DPM emissions during construction activities.

However, mitigation measures are proposed by Energy Commission staff to reduce the maximum calculated PM10 emissions. These include the use of extensive fugitive dust control measures. The fugitive dust control measures are assumed to result in 90%

reductions of emissions. In order to further mitigate potential impacts from particulate emissions during the operation of diesel-powered construction equipment, Energy Commission staff recommends the use of Tier 2 or Tier 1 California Emission Standards for Off-Road Compression-Ignition Engines or the installation of an oxidation catalyst and soot filters on diesel equipment. The catalyzed diesel particulate filters are passive, self-regenerating filters that reduce particulate matter, carbon monoxide, and hydrocarbon emissions through catalytic oxidation and filtration. The degree of particulate matter reduction is comparable for both mitigation measures in the range of approximately 85–92%. Such filters will reduce diesel emissions during construction and thus will further reduce any potential for significant health impacts.

OPERATION IMPACTS AND MITIGATION

Emissions Sources

The emissions sources at the proposed GWF Tracy project include one combustion turbine generator, one auxiliary boiler, one diesel-fueled fire pump, and one existing diesel-fueled emergency generator. No wet cooling tower is proposed; only an air condenser cooling system will be used. As noted earlier, the first step in a health risk assessment is to identify potentially toxic compounds that may be emitted from the facility.

AFC Appendix 5.1B and Table 5.9-2 (GWF Tracy 2008a) list toxic air contaminants expected to be emitted from all sources listed above as combustion byproducts along with their anticipated amounts (emission factors). Toxic Air Contaminant emission factors for the turbine and boiler were obtained from the ARB California Air Toxics Emission Factors database. Emission factors for the diesel engines were obtained from vendors and from the Ventura County Air Pollution Control District (GWF Tracy 2008a, Section 5.9.4.1.1). Table 5.9-3 of the AFC lists toxicity values used to characterize cancer and noncancer health impacts from project pollutants. The toxicity values include Reference Exposure Levels, which are used to calculate short-term and long-term noncancer health effects, and cancer unit risks, which are used to calculate the lifetime risk of developing cancer, as published in the OEHHA Guidelines (OEHHA 2003). **Public Health Table 3** lists the toxic emissions which will be emitted by the project (if licensed and built), their toxicity, and how each might contribute to the health risk analysis.

Public Health Table 3
Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Noncancer (Chronic)	Noncancer (Acute)
Acetaldehyde			✔	✔	
Acrolein				✔	✔
Ammonia				✔	✔
Arsenic	✔	✔	✔	✔	✔
Benzene			✔	✔	✔
1,3-Butadiene			✔	✔	
Cadmium		✔	✔	✔	
Chlorobenzene				✔	
Chromium VI		✔	✔	✔	
Copper					✔
Diesel Exhaust			✔	✔	
Ethyl Benzene	✔		✔	✔	
Formaldehyde			✔	✔	✔
Hexane				✔	
HCl				✔	✔
Lead	✔		✔		
Manganese				✔	
Mercury		✔		✔	✔
Napthalene		✔	✔	✔	
Nickel		✔	✔	✔	✔
PAHs	✔		✔		
Propylene				✔	
Propylene oxide			✔	✔	✔
Selenium				✔	✔
Toluene				✔	✔
Xylene				✔	✔
Zinc					

Source: OEHHA 2003, Appendix L and GWF Tracy 2008a, Table 5.9-3

Emissions Levels

Once potential emissions are identified, the next step is to quantify them by conducting a “worst case” analysis. Maximum hourly emissions are required to calculate acute (one-hour) noncancer health effects, while estimates of maximum emissions on an annual basis are required to calculate cancer and chronic (long-term) noncancer health effects.

The next step in the health risk assessment process is to estimate the ambient concentrations of toxic substances. This is accomplished by using a screening air dispersion model and assuming conditions that result in maximum impacts. The applicant's screening analysis was performed using the ARB/OEHHA Hotspots Analysis and Reporting Program (HARP). Ambient concentrations were used in conjunction with Reference Exposure Levels and cancer unit risk factors to estimate health effects that might occur from exposure to facility emissions. Exposure pathways, or ways in which people might come into contact with toxic substances, include inhalation, dermal (through the skin) absorption, soil ingestion, consumption of locally grown plant foods, and mother's milk.

The above method of assessing health effects is consistent with OEHHA's Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2003) referred to earlier and results in the following health risk estimates.

Impacts

The applicant's screening health risk assessment for the project including emissions from all sources resulted in a maximum acute Hazard Index (HI) of 0.8 and a maximum chronic HI of 0.07 at the point of maximum impact (PMI). The maximum acute and chronic HI calculated at a sensitive receptor were 0.03 and 0.002, respectively (GWF 2008a, Table 5.9-4). As **Public Health Table 4** shows, both acute and chronic hazard indices are less than 1.0, indicating that no short- or long-term adverse health effects are expected.

As shown in **Public Health Table 3**, total worst-case individual cancer risk was calculated by the applicant to be 1.2 in 1 million at the location of maximum impact, about 200 meters south of the project fenceline.

Public Health Table 4
Operation Hazard/Risk at Point of Maximum Impact: Applicant Assessment

Type of Hazard/Risk	Hazard Index/Risk at PMI	Significance Level	Significant?
Acute Noncancer	0.8	1.0	No
Chronic Noncancer	0.07	1.0	No
Individual Cancer	1.2 in a million	10.0 in a million	No

Source: GWF Tracy 2008a, Table 5.9-4

Staff also conducted a quantitative evaluation of the risk assessment results presented in the GWF Tracy Combined Cycle Power Plant Project AFC (08-AFC-07). Emitting units include two natural gas-fired combustion turbines/heat recovery steam generators (HRSGs), a diesel-fueled emergency generator, a diesel fire water pump, and an auxiliary boiler, for a total of five emitting sources evaluated at the proposed facility.

Staff's quantitative analysis of facility operations included the following:

- Stack parameters, building parameters, emission rates and locations of sources were obtained from the AFC and modeling files provided by the applicant.

- Emissions from the 2 combustion turbine/heat recovery steam generator stacks, the diesel emergency generator, the diesel fire water pump, and the auxiliary boiler were included in the analysis.
- Used a receptor grid of -1200 to 1200 m east and -1200 to 1200 m north, at 100 m increments.
- Exposure pathways assessed include inhalation, ingestion of home-grown produce, dermal absorption, soil ingestion and mother's milk.

Atmospheric dispersion modeling was conducted using the CARB/OEHHA Hotspots Analysis and Reporting Program (HARP), Version 1.4a. Screening meteorological data was used, as local meteorological data compatible for use in the HARP ISCST analysis was not provided by the applicant. Receptor elevations were not incorporated into the modeling analysis, as digital elevation model data files compatible with HARP were not provided.

The emission factors used in staff's analysis of cancer risk and hazard were obtained from the AFC and are listed in **Public Health Table 5**. For cancer risk and chronic noncancer hazard calculations using the HARP model, Staff used the "Derived(OEHHA)Method". The following receptor locations were quantitatively evaluated in staff's analysis:

- Point of maximum impact, PMI, determined in the applicant's modeling, located southeast of the site (70 year residential scenario)
- Location of the Maximally Exposed Individual Resident (MEIR), determined in the applicant's modeling, located southeast of the site (70 year residential scenario)

Results of staff's analysis are summarized in **Public Health Table 6** and are compared to the results presented in the AFC for the GWF Tracy project. Substance-specific risks are presented in **Public Health Table 7** for the Point of Maximum Impact determined in this analysis and in **Public Health Table 8** for the maximum impacted residence.

Public Health Table 5
Emission Rates Used in the Cancer Risk and Hazard Analyses Conducted by Staff

Substance	**Annual Average Emissions** (lbs/year)	**Maximum 1-Hour Emissions** (lbs/hour)
EMISSION RATES FROM OPERATION OF EACH COMBUSTION TURBINE/HRSG		
Ammonia	4.80E+04	9.60E+00
Propylene	7.80E+03	1.10E+00
1,3-Butadiene	1.30E+00	1.80E-04
Acetaldehyde	1.40E+03	1.90E-01
Acrolein	1.94E+02	2.60E-02
Benzene	1.36E+02	1.90E-02
Ethylbenzene	1.84E+02	2.50E-02
Formaldehyde	9.40E+03	1.30E+00
Hexane	2.60E+03	3.60E-01
Propylene Oxide	4.80E+02	6.60E-02
Toluene	7.20E+02	9.90E-02
Xylenes	2.60E+02	3.60E-02
Naphthalene	1.70E+01	2.30E-03
PAHs	1.44E-01	1.90E-05
EMISSION RATES FROM OPERATION OF AUXILIARY BOILER		
Acetaldehyde	3.40E+00	8.30E-04
Benzene	1.62E+00	4.00E-04
Formaldehyde	8.40E+00	2.10E-03
Toluene	1.28E+00	3.20E-04
Nickel	7.80E-01	2.00E-04
Copper	3.20E-01	8.00E-05

Public Health Table 5 (cont'd)
Emission Rates Used in the Cancer Risk and Hazard Analyses Conducted by Staff

Substance	Annual Average Emissions (lbs/year)	Maximum 1-Hour Emissions (lbs/hour)	Annual Average Emissions (lbs/year)	Maximum 1-Hour Emissions (lbs/hour)
	EMISSION RATES FROM OPERATION OF DIESEL EMERGENCY GENERATOR		EMISSION RATES FROM OPERATION OF DIESEL FIRE PUMP *	
Diesel PM	1.50E+00	-	3.80E+00	-
Propylene	-	1.00E-02	-	6.80E-03
1,3-Butadiene	-	4.90E-03	-	3.20E-03
Acetaldehyde	-	1.80E-02	-	1.10E-02
Acrolein	-	7.60E-04	-	4.90E-04
Benzene	-	4.20E-03	-	2.70E-03
Ethylbenzene	-	2.40E-04	-	1.60E-04
Formaldehyde	-	3.90E-02	-	2.50E-02
Hexane	-	6.00E-04	-	3.90E-04
Toluene	-	2.40E-03	-	1.50E-03
Xylenes	-	9.50E-04	-	6.20E-04
Naphthalene	-	4.40E-04	-	2.90E-04
PAHs	-	1.30E-03	-	8.10E-04
Chlorobenzene	-	4.50E-06	-	2.90E-06
Lead	-	1.90E-04	-	1.20E-04
Manganese	-	6.90E-05	-	4.50E-05
Mercury	-	4.50E-05	-	2.90E-05
Nickel	-	8.70E-05	-	5.70E-05
Arsenic	-	3.60E-05	-	2.30E-05
Cadmium	-	3.40E-05	-	2.20E-05
Copper	-	9.10E-05	-	6.00E-05
Zinc	-	5.00E-04	-	3.30E-04
HCl	-	4.20E-03	-	2.70E-03
Selenium	-	4.90E-05	-	3.20E-05
Cr(VI)	-	2.20E-06	-	1.50E-06

* Cancer risk and chronic hazard based on annual diesel PM emissions.

Public Health Table 6
Results of Staff's Analysis and the Applicant's Analysis for Cancer Risk and Chronic Hazard

	Staff's Analysis			Applicant's Analysis		
	Cancer Risk (per million)	Chronic HI	Acute HI	Cancer Risk (per million)	Chronic HI	Acute HI
PMI	2.6	0.073	0.84	1.2	0.07	0.8
MEIR	0.97	0.031	0.23	0.3	0.03	0.08

Public Health Table 7
Results of Staff's Analysis: Contribution to Total Cancer Risk by Individual Substances from All Sources at the Point of Maximum Impact (PMI)

Substance	CTG 1	CTG 2	Diesel Emer Gen	Diesel Fire Pump	Auxiliary Boiler	Total
Acetaldehyde	2.59E-08	3.15E-08			2.70E-09	6.01E-08
Benzene	2.52E-08	3.06E-08			1.29E-08	6.86E-08
1,3-Butadiene	1.44E-09	1.75E-09				3.20E-09
Formaldehyde	3.65E-07	4.44E-07			1.40E-08	8.23E-07
Ethyl benzene	2.96E-09	3.60E-09				6.56E-09
Naphthalene	3.77E-09	4.59E-09				8.36E-09
Propylene oxide	1.15E-08	1.40E-08				2.56E-08
Nickel					5.64E-08	5.64E-08
PAHs, total	1.15E-07	1.40E-07				2.55E-07
Diesel PM			3.21E-07	9.37E-07		1.26E-06
SUM	5.51E-07	6.70E-07	3.21E-07	9.37E-07	8.61E-08	2.57E-06

Public Health Table 8
Results of Staff's Analysis: Contribution to Total Cancer Risk by Individual Substances from all Sources at Maximally Impacted Residence (MEIR)

Substance	CTG 1	CTG 2	Diesel Emer Gen	Diesel Fire Pump	Auxiliary Boiler	Total
Acetaldehyde	1.11E-08	1.18E-08		8.56E-10		2.38E-08
Benzene	1.08E-08	1.15E-08		4.08E-09		2.63E-08
1,3-Butadiene	6.18E-10	6.58E-10				1.28E-09
Formaldehyde	1.56E-07	1.67E-07		4.44E-09		3.28E-07
Ethyl benzene	1.27E-09	1.35E-09				2.62E-09
Naphthalene	1.62E-09	1.72E-09				3.34E-09
Propylene oxide	4.95E-09	5.27E-09				1.02E-08
Nickel				1.79E-08		1.79E-08
PAHs, total	4.94E-08	5.26E-08				1.02E-07
Diesel PM			1.12E-07		3.40E-07	4.52E-07
SUM	2.36E-07	2.52E-07	1.12E-07	2.72E-08	3.40E-07	9.66E-07

CUMULATIVE IMPACTS

The applicant has contacted the BAAQMD for a list of projects within a 6-mile radius that may contribute to a public health cumulative impact. The BAAQMD identified two nearby facilities, the East Altamont project and Tesla Power Project. Since the East Altamont project has not been built and does not have an active air permit, the applicant has not included it in a cumulative impacts assessment. The applicant stated that the un-built Tesla project, located about 4.4 miles east, has a predicted cancer risk of 6.85 in one million at the PMI, and that combining the cancer risk values for the two projects results in a risk of about 8.1 in one million, which is still below the level of significance (GWF Tracy 2008a, Section 5.9.5). The applicant also contacted the SJVAPCD for a list of projects within a 6-mile radius that may contribute to a public health cumulative impact and stated that a cumulative impact analysis would be prepared if sources are identified (GWF Tracy 2008a, Section 5.9.5). The applicant then supplied a list of permitted sources within a 6-mile radius (GWF 2008f) and staff believes that the GWF Tracy project would not create a significant cumulative impact when combined with any of these permitted sources. Staff believes that cumulative impacts would only be significant if other sources were so close that the emission plumes would produce a significant cumulative risk where insignificant individual risks exist. Staff has modeled cumulative impacts at other projects in the state and has yet to find a significant cumulative impact.

The maximum cancer risk for emissions from the GWF Tracy project (calculated by staff) is 2.6×10^{-6}. Staff believes that the contribution of the GWF Tracy project to cancer risk is very small when compared to background risk and would not add

cumulatively to any known project existing or in the planning stages. Thus, the GWF Tracy project risks are less than significant in a cumulative context.

COMPLIANCE WITH LORS

Staff has considered the minority population as identified in **Socioeconomics Figure 1** in its impact analysis and has found no potential significant adverse impacts for any receptors, including environmental justice populations. In arriving at this conclusion, staff notes that its analysis complies with all directives and guidelines from the Cal/EPA Office of Environmental Health Hazard Assessment and the California Air Resources Board. Staff's assessment is biased toward the protection of public health and takes into account the most sensitive individuals in the population. Using conservative (health-protective) exposure and toxicity assumptions, staff's analysis demonstrates that members of the public potentially exposed to toxic air contaminant emissions of this project—including sensitive receptors such as the elderly, infants, and people with pre-existing medical conditions—will not experience any acute or chronic significant health risk or any significant cancer risk as a result of that exposure. Staff believes that it incorporated every conservative assumption called for by state and federal agencies responsible for establishing methods for analyzing public health impacts. The results of that analysis indicate that there would be no direct or cumulative significant public health impact to any population in the area. Therefore, given the absence of any significant health impacts, there are no disparate health impacts and thus there are no environmental justice issues associated with **PUBLIC HEALTH**.

Staff concludes that construction and operation of the GWF Tracy project will be in compliance with all applicable LORS regarding long-term and short-term project impacts in the area of **PUBLIC HEALTH**.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

One comment was received from the public. Annette Tuso Elissagaray wrote on behalf of herself, her two brothers, and their families. The Tuso family expressed deep concern about air quality and public health and specifically about air credits purchased in nearby counties, that the most cancer-causing pollutants will fall shortly after leaving the Plant Site and fall directly on the land they farm and the homes they live in, and that they would be breathing potential deadly air.

Response:

Staff has reviewed the human health risk assessment prepared by the applicant and conducted its own independent human health risk assessment. The results are discussed in this Staff Assessment. Both risk assessments demonstrate that the airborne concentrations of toxic air contaminants which would be emitted by the proposed power plant would be so small that they would NOT contribute to any adverse health impact even if a person lived at the point of maximum impact for 24 hours/day, 7 days/week for 70 years. The families expressing concern do not live at the point of maximum impact - no one can as it is in an area zoned for agriculture and it is physically impossible to spend 24 hours/day, 7 days/week for 70 years at the same location - and thus the risk to these families and all other members of the public would be far lower

than that calculated for the point of maximum impact. Therefore, staff can say with a great deal of scientific certainty that no person will become ill or contract cancer as a result of emissions from the proposed power plant. Furthermore, “air credits” from sources shut down in locations within an air basin yet not immediately next door to the proposed power plant - while understandably confusing - do indeed offer tremendous air quality benefits. The facility which ceased to emit did so under a law that allows them to shut-off emissions of both criteria pollutants and toxic air contaminants and gain some financial benefit from this shut-down. It is often the case that the facility would not have stopped emissions without this financial opportunity and the facility received reduced emissions reductions credit, that is, the credits are les than what was actually emitted at the time. Since basin-wide airborne toxics contribute to heath risks at locations distant from the source, any reduction at any location within the air basin has some benefit for all areas of an air basin.

CONCLUSIONS

Staff has analyzed potential public health risks associated with construction and operation of the GWF Tracy project and does not expect any significant adverse cancer, short-term, or long-term health effects to any members of the public, including low income and minority populations, from project toxic emissions. Staff also concludes that its analysis of potential health impacts from the proposed GWF Tracy project uses a conservative health-protective methodology that accounts for impacts to the most sensitive individuals in a given population, including newborns and infants. According to the results of staff’s health risk assessment, emissions from the GWF Tracy project would not contribute significantly or cumulatively to morbidity or mortality in any age or ethnic group residing in the project area.

PROPOSED CONDITIONS OF CERTIFICATION

None.

REFERENCES

BAAQMD (Bay Area Air Quality Management District). 2007. Toxic Air Contaminant Control Program Annual Report 2003. Volume I. August.

California Air Resources Board. 2002. California Air Quality Data, <http://www.arb.ca.gov/aqd/aqd.htm>.

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

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CH2M2008f- CH2MHILL /J. Salamy (tn:49055). Data Response Set 1, dated 11/19/2008. Submitted to CEC/Docket Unit on 11/19/2008.

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SRP (Scientific Review Panel on Toxic Air Contaminants). 1998. Findings of the Scientific Review Panel on The Report on Diesel Exhaust as adopted at the Panel's April 22, 1998, meeting.

SOCIOECONOMICS

Testimony of Jacob Hawkins M.E.S.M.

SUMMARY OF CONCLUSIONS

Energy Commission staff concludes that the nominal 145-megawatt (MW) expansion of the existing 169-MW Tracy Peaker Project, referred to as the GWF Tracy Combined Cycle Power Plant Project (GWF Tracy or proposed project), would not result in significant adverse direct or indirect socioeconomics impacts. In addition, the proposed project would not contribute to a cumulative socioeconomic impact on the area's population, employment, housing, police, schools, or hospitals because the construction and operation workforce required for GWF Tracy largely resides in the regional or local labor market area. The construction and operation of the proposed project would not result in any disproportionate adverse socioeconomic impacts to any low-income or minority population. Gross public benefits from GWF Tracy include capital costs and sales taxes as well as the generation of secondary jobs and income.

INTRODUCTION

Energy Commission staff's socioeconomics impact analysis evaluates project-related changes on existing population and employment patterns, community services, and provides demographic information related to environmental justice. A discussion of the estimated beneficial economic impacts of the construction and operation of the proposed project and other related economic impacts is provided. Information provided herein was obtained from the GWF Tracy Application for Certification (AFC) Section 5.10 (Socioeconomics) and independently reviewed by Energy Commission staff.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Socioeconomics Table 1 contains socioeconomics laws, ordinances, regulations, and standards (LORS) applicable to GWF Tracy.

Socioeconomics Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
California Education Code, Section 17620	The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.
California Government Code, Sections 65996-65997	Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.

SETTING

PROJECT STUDY AREA

The proposed GWF Tracy Combined Cycle Power Plant Project (GWF Tracy) would be located in an unincorporated area of San Joaquin County adjacent to the Union Pacific Railroad and Delta-Mendota Canal near the city of Tracy. The proposed project would occupy 16.38 acres within the existing 40-acre GWF site with an additional 3.28 acres of permanent construction and 12.3 acres of temporary construction laydown located on the 40-acre GWF site. GWF Tracy would be owned and operated by GWF Energy, LLC (GWF). Research shows that workers may commute as much as two hours each direction from their communities rather than relocate (EPRI1982a). Therefore, for purposes of this analysis, the socioeconomics study area is the County of San Joaquin.

POPULATION CHARACTERISTICS

To characterize the population profile of the study area, current and forecasted population trends are summarized in **Socioeconomics Table 2**. **Socioeconomics Table 3** shows the historic and projected population growth rates for the study area and the state. San Joaquin County is projected to have a higher rate of growth than the California average, and historic rates of growth for the city of Tracy are substantially greater than the California average.

Socioeconomics Table 2
Population Profile of the Study Area, Year 1990–2030

	Year					
Area	**1990 Population**	**2000 Population**	**2008 Population**	**2010 Projected Population**	**2020 Projected Population**	**2030 Projected Population**
City of Tracy	33,558	56,929	81,548	NA	NA	NA
San Joaquin County	480,628	563,598	685,660	741,147	965,094	1,205,198
California	29,758,213	33,873,086	38,049,462	39,135,676	44,135,923	49,240,891

Source: DOF2009a, DOF2009b, DOF2009c
NA = Not Available

Socioeconomics Table 3
Historic and Projected Population Growth Rates
(Given in Percentages)

	Year					
Area	**1990-2000**	**2000-2008**	**2008-2010**	**2000-2010**	**2010-2020**	**2020-2030**
City of Tracy	70	43	NA	NA	NA	NA
San Joaquin County	17	21	8	31	30	25
California	14	12	3	16	13	12

NA = Not Available

DEMOGRAPHIC SCREENING

The purpose of the demographic screening is to determine whether a below-poverty-level and/or minority population exists within the six-mile radius, or potential affected area of the proposed GWF Tracy site. The demographic screening process is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality, 1997) and *Final Guidance for Incorporating Environmental Justice Concerns in EPA's in NEPA's Compliance Analyses National* (Council on Environmental Quality, 1998). The screening process relies on Year 2000 U.S. Census data to determine levels of minority and below-poverty-level populations.

In 1997, the President's Council on Environmental Quality issued Environmental Justice guidance defining *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. Minority population concentrations, as defined by this guidance document, are identified where:

- The minority population of the affected area is greater than 50% 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; or
- One or more census blocks in the affected area have a minority population greater than 5%.

Socioeconomics Figure 1 shows the minority population within the six-mile radius of the proposed GWF Tracy site. The total population of census blocks within the six-mile radius is 61,949 persons, with a total minority population of 28,009 persons (or 45.2% of the total six-mile radius population). **Socioeconomics Figure 1** also shows 208 census blocks (out of 748 census blocks) that include minority populations greater than 50%.

Below-poverty-level populations are identified based on Year 2000 census block group data. Poverty status excludes institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old. The total population of census block groups within a six-mile radius of the GWF Tracy site (for which poverty status was determined by the US Census) is 61,105 persons with a total of 5,362 persons below the poverty level (or 8.7% of the total six-mile radius population for which poverty status was determined).

EMPLOYMENT CHARACTERISTICS

The study area includes the city of Tracy and San Joaquin County. **Socioeconomics Table 4** presents Year 2008 labor force characteristics for San Joaquin County. As shown in **Socioeconomics Table 4**, the study area is diverse in industry employment. The trade, transportation, and utilities industry has the largest employment numbers within the study area. Socioeconomics Table 5 shows the labor force by craft for the Stockton MSA, which includes all of San Joaquin County, and the required project

construction workforce by craft. Given the robust and skilled workforce within the study area, staff does not expect a shortage of project workers or an influx of workers from outside the study area.

Socioeconomics Table 4
Study Area 2008 Labor Force Characteristics

Industry	**San Joaquin County Labor Force Characteristics**
Total Farm	12,100
Construction	12,200
Education and Health Services	28,000
Financial Activities	8,800
Government	40,000
Information	2,600
Leisure and Hospitality	17,700
Manufacturing	24,100
Natural Resources and Mining	200
Professional and Business Services	19,200
Trade, Transportation, and Utilities	52,600
Other Services	7,300
Total Employed	*223,800*
Unemployment Rate	8.3%

Source: CAEDD2008a

Socioeconomics Table 5
Total Labor by Skill in Stockton MSA (San Joaquin County)
And GWF Tracy Required Construction by Craft

Trade	Stockton MSA 2006	Stockton MSA 2016	Total # of Workers for Project Construction by Craft
Boilermaker	13,010[1]	13,540[1]	60
Carpenter/Indirect craft	2,080	2,140	62
Cement Masons	550	580	4
Electricians	1,260	1,290	72
Ironworkers	340	350	56
Laborers	2,920	3,230	24
Millwrights	80	80	36
Operators	57	600	18
Painters	810	840	6
Pipefitter	950	980	70
Contractor Staff	13,010[1]	13,540[1]	NA

Source: EDD 2009.
1 The "Construction Trades Workers" category was used, of which both "contractor staff" and "boilermakers" are considered a part of. These numbers overstate the actual number of both contractor staff and boilermakers, but were the only number available, as both the "Contractor Staff" and "Boilermaker" categories were not broken out for the EDD Stockton MSA labor force projections Construction and Extractions Occupation data sets.

HOUSING

Socioeconomics Table 6 shows there were 227,339 total housing units in the study area in 2008, with 8,957 of these units being vacant, creating an average vacancy rate of 3.94% for the study area.

Socioeconomics Table 6
Housing Units in the Study Area, Year 2008

	Total Units	Single-Family	Multi-Family	Mobile Homes	Percent Vacant
City of Tracy	25,478	21,961	3,041	476	2.58
San Joaquin County	227,339	83,229	41,541	9,731	3.94

Source: CDOF2008a

FISCAL REVENUE

Fiscal effects of the proposed project include the following:

Proposition 13 tax of $2,396,100

Construction total (state and local) sales tax of $271,250

Operation total (state and local) sales tax of $11,625

School impact fee of $2,300

Non-fiscal (private sector) impacts include:

- Total capital costs of $232 million;
- 22-month construction payroll of $50 million; annual operations payroll of $2.3 million; AND
- Approximately $3.5 million to be spent locally on construction materials and supplies and $150,000 for operation and maintenance supplies.

PUBLIC SERVICES

Physical impacts to public services and facilities are usually associated with population in-migration and growth in an area, which increase the demand for a particular service, leading to the need for expanded or new facilities. Service providers serving the GWF Tracy site are located within San Joaquin County. Therefore, the study area for the public services analysis is limited to San Joaquin County.

Police Protection

The proposed GWF Tracy site is located within the San Joaquin Sheriff's Department (SJSD) jurisdiction which serves unincorporated areas of San Joaquin County. The SJSD is located at 7000 Michael Canlis Boulevard, French Camp, CA. There are approximately 272 sworn personnel within the SJSD, with 138 in the patrol division. The average response time to the project site would be approximately 15 to 20 minutes (GWF 2008a).

The California Highway Patrol (CHP) is the primary law enforcement agency for state highways and roads. The CHP division covering highways within the project area is the Tracy CHP, located about four miles from the project site at 385 W. Grantline Road, Tracy, CA (GWF2008a, CHP2009a).

Schools

There are fourteen unified school districts within the project area, with the proposed project site within the Lammersville Elementary School District (LESD) and Tracy Joint Unified School District (TSD). The nearest elementary school is George Kelly Elementary School, approximately 2 miles northeast of the proposed GWF Tracy site which has approximately 1,100 students and the nearest secondary school will be the new John C. Kimball High School, approximately 1.7 miles northeast of the proposed GWF Tracy site with a planned capacity of approximately 2,400 students (SJCOE2009a).

Hospitals

There are three hospitals that are located within 40 miles of the project site. Sutter Tracy Community Hospital, with 82 beds, is approximately 5 miles from the project site. Sutter Tracy Community Hospital has a 24-hour emergency department and is the priority hospital for ambulance transport. This hospital is located at 1420 N. Tracy Boulevard in Tracy.

Doctors Medical Center, with 465 beds, is approximately 38 miles from the project site. Doctors Medical Center has a Level III trauma center with resources for emergency

resuscitation, surgery, and intensive care, and a heli-pad for air transport. Doctors Medical Center is located at 1441 Florida Avenue in Modesto. Memorial Medical Center is approximately 39 miles from the project site and has 423 beds. Memorial Medical Center has a trauma center and heli-pad. This hospital is located at 1700 Coffee Road in Modesto (GWF2008a).

ASSESSMENT OF IMPACTS

Staff reviewed the socioeconomic section of the GWF Tracy AFC and the socioeconomic data provided and referenced from various governmental agencies and trade associations, and conducted its own independent analysis to form the following socioeconomics analysis and conclusions.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project may have a significant effect on population, housing and public services if the project will:

- Induce substantial population growth in an area, either directly or indirectly;
- Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere; or
- Adversely impact acceptable levels of service for fire and police protection, schools, parks and recreation, and other public facilities

A socioeconomic analysis looks at beneficial impacts on local finances from property and sales taxes as well as potential adverse impacts on public services. To determine if a project would have any significant impacts, staff analyzes whether the current status of community services and capacities can absorb the project related impacts in each of these areas. If the project's impacts could appreciably strain or degrade these services, staff considers this to be a significant adverse impact and would propose mitigation. A project's property taxes, sales tax or local school impact fees or development fees can help local governments to augment public services as needed. The analysis of subject areas such as capacities of fire service providers, utilities, water use, and wastewater disposal are identified in the **WORKER SAFETY AND FIRE PROTECTION**, **SOIL AND WATER RESOURCES**, and **WASTE MANAGEMENT** sections of the Staff Assessment.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Population and Employment

As stated in AFC Section 3.0, construction of GWF Tracy would last for 22 months. Required construction personnel would consist of craftspeople and supervisory, support, and construction management workers on-site during construction. There would be an average of approximately 171 daily construction workers, with a peak daily workforce of 398 during month 17 of construction. This peak employment number is

used to analyze worst-case construction population and employment impacts. With the size of the local construction workforce, the applicant estimates that approximately 60% of the workforce would come from the local area.

The Impact Analysis for Planning (IMPLAN) model (an input-output model), used by the applicant to estimate employment and income impacts from GWF Tracy on the study area is 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. 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)[1] multipliers were used for the applicant's economic impact analysis. SAM multipliers are similar to Type II[2] multipliers because they both include the indirect and induced effects (secondary impacts). IMPLAN multipliers were used to calculate direct, indirect, and induced jobs and expenditures in the regional economy.

The IMPLAN runs estimate total construction employment at 318 total jobs (147 secondary jobs) based on an average of 171 project-related construction jobs. The GWF Tracy annual local construction expenditures of $1.91 million and annual construction payroll of $30 million resulting in $11.45 million in spending by local construction workers would result in an estimated $4.98 million in secondary labor income for a beneficial total impact of approximately $18.34 million.

For GWF Tracy operations, 17 direct operations jobs and 17 jobs as secondary impacts yield an estimated total of 34 jobs. $7.3 million in annual operations expenditures, of which $150,000 would be spent locally, yielding a beneficial secondary impact of approximately $559,920 and a total income impact of approximately $709,920.

Staff finds the economic impact analysis reasonably consistent with the economic literature cited by many economists (Moss et al. 1994 and Mulkey et al. 2000) and therefore finds these projected beneficial economic impacts reasonable.

Construction workers commute as much as two hours each direction from their communities rather than relocate (EPRI1982a). Staff reviewed the socioeconomics data for counties within the two-hour commute range, which is within the study area and includes San Joaquin County. **Socioeconomics Table 3** indicates that approximately 12,200 construction workers are available within the study area. The peak 398 daily

[1] Type SAM multipliers capture inter-institutional transfers and account for social security and income tax leakages, institutional savings, and commuting and Type II multiplier effects (direct, indirect, and induced).

[2] A Type I multiplier is the ratio of the direct plus indirect change to the direct change resulting from a unit increase in final demand for any given sector. A Type II multiplier is the ratio of the direct, indirect, and induced change to the direct change resulting from a unit increase in final demand. The Type II multiplier takes into account the GWF Tracy repercussionary effects of secondary rounds of consumer spending in addition to the direct and indirect inter-industry effects (Richardson 1972). Both multipliers can be of an income or employment type. Indirect changes are production changes in industries supplying the original industry (backward linkages). Induced changes are changes in regional household spending levels caused by regional employment impacts.

construction workers represent approximately 3% of the total construction workforce from within San Joaquin County. The construction labor needed would not substantially impact the study area's workforce.

The applicant states that approximately 60% of the construction workforce would come from within a two-hour commute which would include the City of Tracy first, then San Joaquin County. For construction of the facility, approximately 239 construction workers (about 60%) of the maximum 398 construction workers would be drawn from within the two-hour commute area. This indicates that approximately 159 construction workers would be drawn from outside the two-hour commute area and would temporarily relocate to the City of Tracy and San Joaquin County.

The influx of 159 construction workers to the city of Tracy, as shown above in **Socioeconomics Table 2,** would represent an increase of less than 1% to the population in the immediate area surrounding the GWF Tracy site. It is anticipated that these additional, temporary construction workers would be housed in the city of Tracy or other towns and cities in San Joaquin County. The influx of an additional 159 workers to the overall study area would represent an approximate 0.2% increase in county population. Therefore, no significant impacts would occur to existing population levels or employment distribution within the study area from construction of the proposed project.

According to AFC Section 5.10, GWF Tracy is expected to require a total of 17 additional permanent full-time employees. Research shows that operational workers commute as much as one hour to a power plant site from their homes rather than relocate (EPRI1982a). As shown in **Socioeconomics Tables 4** and **5**, due to the large labor force located within the study area, new employees required for the proposed project would be hired locally. As all workers are expected to reside within the study area, no impacts to existing population levels would occur. Because the number of operational workers required represents such a small portion of the local available labor force, no significant impacts to the study area population or employment base would result from proposed project operation.

Housing

The proposed GWF Tracy site is on land zoned for and used as agricultural use. No residential structures would need to be removed during construction or operation of the project. As such, no housing would be displaced. As presented in **Socioeconomics Table 6**, there were 227,339 total housing units within the study area, with 8,957 vacant units, resulting in a 3.94% vacancy rate. As discussed above, 60% of the workers would be drawn from the existing workforce within commuting distance of the proposed GWF Tracy site, and 40% would be temporarily drawn from outside the study area, but would be housed in regional centers across the study area. The 159 temporary workers would occupy approximately 1.8% of vacant housing units. As discussed above, GWF Tracy operation would require 17 employees that are expected to come from within the study area. In the unlikely event that any workers come from outside the study area, ample vacant housing is available. Therefore, no construction or operation-related significant impacts are expected on the local housing supply, availability, or demand.

Fiscal and Economic Effects

Property Taxes

Assuming a capital cost of $232 million, GWF Tracy would generate approximately $2.4 million in property taxes annually. This property tax revenue would be distributed among local jurisdictions within San Joaquin County based on the County Auditor's formula. Senate Bill 1317, signed into law on September 30, 2006, makes changes to how property taxes for new power plants constructed after January 1, 2007, will be allocated to local jurisdictions within a county. The total amount of assessed values allocated to any particular county would not be affected, but more of the revenue will be directed to the area where the actual construction occurs. The share of revenue that would ordinarily flow to other cities within the county would be directed to the jurisdiction in which the construction actually occurs, in this case the city of Tracy. The share of revenues that would flow to other special service districts within the county, such as fire districts or school districts, would not change.

Sales Tax

The estimated total construction cost of the proposed project is approximately $232 million with approximately $50 million going towards construction payroll. With local construction workers comprising approximately 60% of the labor workforce, approximately $30 million would be paid to local construction workers. The applicant expects that approximately $3.5 million worth of construction materials would be purchased locally. Along with local workers using a portion of their earnings in the local economy, the applicant estimates that construction would generate approximately $271,250 in sales tax revenues.

Public Services

Physical impacts to public services and facilities are usually associated with population in-migration and growth in an area, which increase the demand for a particular service and lead to the need for expanded or new facilities. An increase in population in any given area may result in the need to develop new or alter existing public services and associated facilities to accommodate increased demand. The **SOCIOECONOMICS** analysis focuses on the proposed project impacts to public services such as law enforcement, schools, and hospitals. The analysis of proposed project impacts to fire protection service levels is discussed within the **WORKER SAFETY AND FIRE PROTECTION** section of this document.

Law Enforcement

Approximately 239 of the required construction labor force and all of operational labor force would reside within the two-county study area. While the 159 maximum temporary workers would increase the total population of Tracy and San Joaquin County, as this represents an approximate 0.2% increase in the population of this county, there would be no need for an increase in law enforcement services or facilities in the study area. Additionally, the 17 personnel required for operation of the project would be drawn from the existing population in the study area and would not increase the local population.

Therefore, construction and operation activities at GWF Tracy would not significantly impact the existing service levels or response times of the SJSD and CHP serving the GWF Tracy site or surrounding area.

Schools

As discussed earlier in the population and employment analysis, the 159 construction workers who would temporarily relocate for construction of the proposed GWF Tracy would represent an approximately 0.2% increase in the population of the study area. Operation of GWF Tracy is expected to employ a total of 17 full-time employees who are expected to maintain their existing residences within the study area labor force. Consequently, the proposed project would not result in any direct population growth to the area that could generate a need for expanded school facilities. No impacts to schools would occur.

Education Code section 17620 authorizes a school district to levy a fee against any construction within a district. State and local agencies are precluded from imposing additional fees or required payments on development projects for the purpose of mitigating possible enrollment impacts to schools. Local commercial school impact fees for the Lammersville Elementary School District are currently $0.28 per square foot of principle building area and $0.18 per square foot of principle building area for Tracy School District. The applicant has stated in AFC Section 5.10.4.4.6 (Impacts on Education) that $2,300 in school impact fees would be paid to the school districts (GWF2008a).

With the payment of the school impact fees and without any substantial addition of students to Lammersville Elementary School and Tracy School Districts, there are no significant adverse socioeconomic impacts on educational resources from the facility.

Parks and Recreation

Approximately 159 construction workers for this project would be drawn from outside the study area, representing a 0.2% increase in the population of the study area. As this construction labor force would be relocating for only a short period, it is unlikely to bring dependents. Overall, short-term construction labor requirements for GWF Tracy (an estimated 398 peak workers) and a small operational workforce of 17 residents within thestudy area), should not have a significant adverse socioeconomic impact on parks and recreation.

Hospitals

The proposed project would not directly or indirectly induce substantial population growth in the area. The proposed GWF Tracy site is served by several hospitals equipped to provide 24-hour emergency rooms (GWF2008a). No additional constraints or physical impacts would occur to the healthcare services or facilities provided by the hospitals serving the GWF Tracy site. Staff concludes that the medical services are adequate for the GWF Tracy's construction and operation. For additional discussion see the **WORKER SAFETY** section of this document. Therefore, construction and operation of the proposed project would have no impacts to hospital facilities.

CUMULATIVE IMPACTS

A project may result in significant adverse cumulative impacts when its effects are "cumulatively considerable." Cumulatively considerable means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, or the effects of probable future projects (Title 14, California Code of Regulations, section 15130). Cumulative socioeconomics impacts could occur when more than one project has an overlapping construction schedule that creates a demand for workers that cannot be met by the local labor force, resulting in an influx of non-local workers and their dependents.

In addition to the GWF Tracy, the applicant identified 10 projects with permits or permit applications within a five mile radius of the project area (GWF2008a). There are three new residential construction projects proposed: the Ellis Specific Plan, Tracy Hills development, and Mountain House development. The residential components of these three projects would result in the construction of approximately 24,675 new homes. Other proposed development includes institutional projects such as Kimball High School and Pastor of St. Bernard's Church as well as a variety of commercial and light industrial projects. **Socioeconomics Tables 4** and **5** show the study area has a robust and skilled labor force residing in San Joaquin County. Therefore, staff does not expect the proposed project to contribute cumulatively to the area's population, employment, housing, police, schools, parks, or hospitals.

Despite the potential for construction schedule overlaps with known projects within the proposed GWF Tracy study area, staff does not anticipate any adverse cumulative socioeconomic effects from either the construction or operation of the proposed project, because of the robust and skilled workforce residing in San Joaquin County. In addition, both the short-term construction-related and long-term operation-related spending activities of GWF Tracy are expected to have cumulative economic benefits to the study area. The cumulative benefits would increase when revenues accrued as a result of the proposed project are combined with spending and any local revenues accrued as a result of current and future reasonably foreseeable cumulative development projects.

NOTEWORTHY PUBLIC BENEFITS

Important public benefits discussed earlier under the fiscal and economic effects section, include both the short-term construction related and long-term operational related increase in local expenditures and payrolls, as well as property and sales tax revenues.

RESPONSE TO COMMENTS

Written comments were provided on the contents of the PSA from agencies, organizations and members of the public. Comments related to specific issues presented in the **SOCIOECONOMICS** section of the PSA are summarized below followed by a response. The applicant (GWF Energy, LLC) provided one minor comment on the **SOCIOECONOMICS** section, which staff has addressed.

Comment 1: GWF Energy, LLC (July 2009): Page 5.8-6, Schools – The Tracy Unified School District is expected to complete the construction of the John C. Kimball High School for fall 2009 enrollment. The high school is located at 3200 Jaguar Run, Tracy, California and is approximately 1.7 miles from the project site.

Response: Text has been revised to include discussion of Kimball High School in the discussion of schools in the setting section.

CONCLUSIONS

No significant adverse socioeconomics impacts would occur as result of the construction or operation of GWF Tracy. Staff believes the proposed project would not cause a significant adverse direct, indirect, or cumulative impact on population, employment, housing, public finance, local economies, or public services. In addition, because there would be no adverse project-related socioeconomic impacts, minority and low-income populations would not be disproportionately impacted. The proposed project would benefit the study area in terms of an increase in local expenditures and payrolls during construction and operation of the facility. These activities would have a positive effect on the local and regional economy.

Socioeconomics Table 7 provides a summary of socioeconomic data and information from this analysis, with emphasis on economic benefits of GWF Tracy.

Socioeconomics Table 7
Project Data and Information

Estimated Project Capital Cost	$232 million
Estimate of Locally Purchased Materials	
Construction	$3.5 million
Operation (Operation & Maintenance)	$0.15 million per year
Estimated Annual Property Taxes	$2,396,100
Estimated School Impact Fees	$2,300
Estimated Direct Employment	
Construction (average)	171 average jobs per month (total of)
Operation	17 persons
Estimated Direct Payroll	
Construction	$50 million (estimated)
Operation	$2.3 million annually (estimated)
Estimated Total Sales Taxes (Total: Combined State, County and local)	
Construction	$271,250
Operation	$11,625
Existing Unemployment Rates	8.3% (San Joaquin County)
Percent Minority Population (6 mile radius)	45.2%
Percent Poverty Population (6 mile radius)	8.0%

PROPOSED CONDITIONS OF CERTIFICATION

No Conditions of Certification are proposed for this project.

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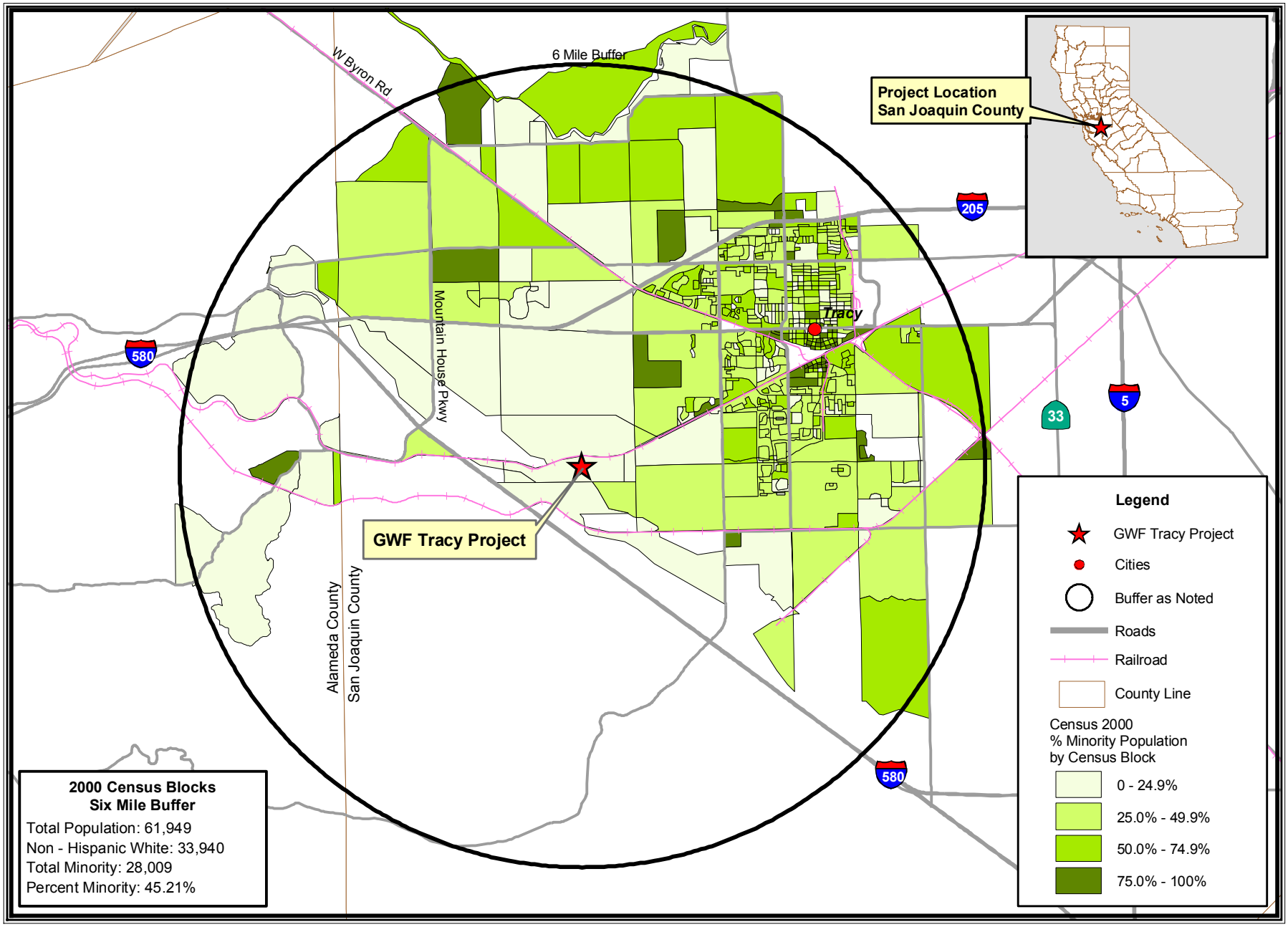
SOCIOECONOMICS - FIGURE 1

GWF Tracy Project - Census 2000 Minority Population by Census Block - Six Mile Buffer



CALIFORNIA ENERGY COMMISSION, ENERGY FACILITIES SITING DIVISION, OCTOBER 2009

SOURCE: California Energy Commission Statewide Power Plant Maps 2008 - Census 2000 PL 94-171 Data - Matrix PL2

SOIL & WATER RESOURCES

Testimony of Vince Geronimo, PE, and Rachel Cancienne, EIT

SUMMARY OF CONCLUSIONS

This section of the Final Staff Assessment (FSA) analyzes the potential effects on soil and water resources that would occur by construction and operation of the proposed GWF Tracy Combined Cycle Power Plant (GWF Tracy) Project. Based on its assessment of the proposed GWF Tracy Project, staff concludes the following:

- Implementation of Best Management Practices (BMPs) during GWF Tracy construction and operation in accordance with effective Storm Water Pollution Prevention Plans (SWPPP) and a Drainage, Erosion and Sedimentation Control Plan (DESCP) would avoid significant adverse effects that could be caused by transport of sediments or contaminants from the GWF Tracy site and associated linear facilities by wind or water erosion.
- Stormwater runoff from all disturbed areas of the 40 acre site would not cause significant impacts with the implementation of sedimentation basins that remain active throughout construction and the subsequent period necessary for non-industrial use areas to become sufficiently re-vegetated.
- The proposed fresh water supply for the project would not cause a significant adverse environmental impact on current or future users of the water supply.
- The proposed use of a freshwater supply would be consistent with state water policy found in State Water Resources Control Board (SWRCB) Resolution 75-58, and the Energy Commission's 2003 Integrated Energy Policy Report (IEPR) water policy because there is no economically feasible or environmentally desirable alternative.
- GWF Tracy has proposed the use of an alternative cooling technology which is environmentally desirable and economically feasible.
- The proposed project would be constructed to comply with 100-year flood requirements and would not exacerbate flood conditions in the vicinity of the project.
- The discharge of sanitary wastewater to a septic tank/leach field discharge system would not degrade surface or groundwater quality.
- The proposed project would comply with all applicable federal, state, and local laws, ordinances, regulations and standards with the adoption of the recommended conditions of certification.
- GWF Tracy would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources with adoption of the conditions of certifications.

Staff concludes that the GWF Tracy project would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources and would comply with all applicable laws, ordinances, regulations and standards (LORS) if all of the recommended conditions of certification are adopted by the Commission and implemented by GWF.

INTRODUCTION

This section of the Final Staff Assessment (FSA) analyzes the potential effects on soil and water resources by the GWF Tracy Project. This analysis specifically focuses on the potential for GWF Tracy to:

- Cause accelerated wind or water erosion and sedimentation;
- Exacerbate flood conditions in the vicinity of the project;
- Adversely affect surface or groundwater supplies;
- Degrade surface or groundwater quality; and
- Comply with all applicable laws, ordinances, regulations and standards (LORS) and State policies.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Soil and Water Resources Table 1
Laws, Ordinances, Regulations, and Standards (LORS) and Policies

Applicable Law	Description
Federal	
Clean Water Act (CWA) (33 USC Section 1251 et seq.)	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. This includes regulation of storm water discharges during construction and operation of a facility normally addressed through a general National Pollutant Discharge Elimination System (NPDES) permit.
CWA Section 401	Section 401 of the CWA requires that any activity that may result in a discharge into a water body must be certified by the Regional Water Quality Control Board (RWQCB)
CWA Section 404	Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (ACOE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. The ACOE issues site specific or general (Nationwide) permits for such discharges.
Resource Conservation and Recovery Act (RCRA) (40 CFR Part 260, et seq.)	RCRA seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.
National Resources Conservation Service (NRCS), National Engineering Handbook, Sections 2 and 3 (1983)	Sections 2 and 3 of the USDA-NRCS National Engineering Handbook (1983) provide standards for soil conservation and erosion prevention during construction activity.
State	
California Constitution, Article X, Section 2	The State Constitution requires that the water resources of the state be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited.
Porter Cologne Water Quality Control Act (PCWQCA) (Water Code §13000 et seq.)	PCWQCA requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These standards are typically applied to the proposed project through the Waste Discharge Requirements (WDR) permit. These regulations require that the RWQCB issue Waste Discharge Requirements specifying conditions regarding the construction, operation, monitoring and closure of waste disposal sites, including injection wells and evaporation ponds for waste disposal.
California Water Code (CWC) Section 13550	CWC Section 13550 requires the use of reclaimed water for industrial purposes subject to reclaimed water being available and meeting certain conditions such as 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.

Applicable Law	Description
California Water Code (CWC) Section 13552.6	CWC Section 13552.6 prohibits the use of domestic water for cooling towers if suitable recycled water is available.
Recycling Act of 1991 (Water Code § 13575 et esq.)	The Water Recycling Act of 1991 encourages the use of recycled water for certain uses and establishes standards for the development and implementation of recycled water programs.
State Policies and Guidelines	
Energy Commission Integrated Energy Policy Report (IEPR) 2003	Consistent with State Water Resources Control Board Policy 75-58 and the Warren–Alquist Act, the Energy Commission will approve the use of fresh water for cooling purposes by power plants it licenses only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound". "Additionally, the Energy Commission will require zero liquid discharge technologies unless such technologies are shown to be "environmentally undesirable" or "economically unsound".
State Water Resources Control Board (SWRCB) Policies: Resolution 75-58 & Resolution 88-63	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. Resolution 75-58 defines fresh inland waters as those "which are suitable for use as a source of domestic, municipal, or agricultural water supply and which provide habitat for fish and wildlife". Resolution 88-63 defines suitability of sources of drinking water. The total dissolved solids must exceed 3,000 mg/l for it to not be considered suitable, or potentially suitable, for municipal or domestic water supply.
Local	
San Joaquin County General Plan 2010, Section IV (Community	Section IV of the Plan (Community Development) defines policies regarding transmission lines in the Utilities Section. Policies regarding soil conservation are found in the Agricultural Lands Section of the Resources portion (Section VI) of the Plan.
Title 9—Development Title of San Joaquin County	The Development Title of San Joaquin County provides requirements for land alteration within the county. Divisions of concern within the Development Title include: Division 6 (Agricultural Zones), Division 11 (Infrastructure Standards), Division 14 (Grading and Excavation Regulations), and Division 15 (Natural Resources Regulations).
Improvement Standards for San Joaquin County	The Improvement Standards for San Joaquin County provide minimum design standards and standard plans for road, storm drain, water system, sewer system, and other improvements within the county.
San Joaquin County Standard Specifications and Special Provisions	The San Joaquin County Standard Specifications and Special Provisions provide the county's minimum requirements for excavation safety, dust control, earthwork, watering, erosion control, and pollution control.

REGIONAL SETTING

The GWF Tracy site location is unchanged from the original Tracy Peaker Plant (TPP) licensed site (01-AFC-16). GWF Tracy is located in the southwest quarter of Section 36, Township 2 South, Range 4 East, Mount Diablo Base Meridian on Assessor's Parcel Number 799-000-45, which is immediately southwest of Tracy, California, and approximately 20 miles southwest of Stockton, California. Within the existing GWF Energy LLC (GWF)-owned 40-acre parcel, approximately 16.38 acres of the site would be fenced to accommodate the project, including the relocated stormwater retention basin.

The property is adjacent to the Delta-Mendota Canal to the southwest, agricultural property to the south and east, and the Union Pacific Railroad to the north. Immediately north of the railroad are the Owens-Brockway glass container manufacturing plant and the Nutting-Rice warehouse. The Tracy Biomass power plant is approximately 0.6 mile to the northwest (GWF2008a).

GWF Tracy is located within the San Joaquin Basin, which includes the San Joaquin Valley, the eastern slope of the Coast Ranges, and the western slope of the Sierra Nevada. The principal streams in this watershed are the San Joaquin River and its larger tributaries: the Cosumnes, Calaveras, Mokelumne, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno rivers. Runoff from the Sierra Nevada and Coast Ranges supplies the San Joaquin River with fresh surface water before eventually flowing out to the Sacramento–San Joaquin Delta. GWF Tracy is not located near any of these surface water features.

Several canals, including the Delta-Mendota Canal and the California Aqueduct carry fresh water from the San Joaquin and Sacramento Rivers to the Tracy area via the California Department of Water Resources (DWR) State Water Project (SWP) and the federal Central Valley Project (CVP). These sources provide water to agricultural lands as well as cities and industries throughout the San Joaquin Valley region and Southern California. The Delta-Mendota Canal is adjacent to the GWF Tracy site, and the California Aqueduct is approximately one-half mile southwest of the site (GWF2008a).

CLIMATE AND PRECIPITATION

The Tracy area is arid to semiarid, with hot summers and mild winters. Most precipitation occurs between the months of October and May. The mean annual precipitation (October 1934 to December 2007) is 9.66 inches per year. Precipitation data are available from the Tracy Carbona weather station. **Soil and Water Resources Table 2** provides average historical rainfall from the Tracy Carbona weather station.

Soil and Water Resources Table 2
Rainfall near the Proposed Project Site (1934-2007)

	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Precipitation Average	9.66	0.51	1.02	1.68	1.92	1.65	1.41	0.78	0.35	0.06	0.07	0.07	0.14

Source: DWR-CDEC, 2007.

GROUNDWATER

GWF Tracy is located within the Central Valley aquifer system, which consists of post-Eocene continental rocks and deposits and contains most of the fresh water in the valley. Underlying the continental deposits are tertiary marine sediments that contain mostly saline water, except in certain areas where an influx of fresh water has flushed out the saline water.

The aquifer system in the San Joaquin Valley generally consists of an upper and a lower aquifer, separated by a relatively thick clay layer of regional extent (the Corcoran Clay member of the Tulare). These clay zones function as impermeable aquitards that restrict vertical and lateral movement of groundwater. Several of these clay beds were deposited in a lake that once occupied the San Joaquin Valley trough. The Corcoran Clay is silty, diatomaceous clay with low permeability and is one of the largest confining bodies in the region, underlying an area of approximately 5,000 square miles.

Although the Corcoran Clay is believed to be a competent barrier between the upper and the lower aquifers in the southern sections of the San Joaquin Valley, the Corcoran Clay becomes increasingly thin as it extends north toward the GWF Tracy site. Where the Corcoran Clay disappears, the lower aquifer is no longer isolated from the upper aquifer (GWF2008a). The absence of the Corcoran Clay allows the regional groundwater flow to be affected by numerous lenses of fine-grained materials that are distributed throughout the aquifer, potentially leading to variably-sized perched water tables and areas of decreased permeability.

PROJECT, SITE, AND VICINITY DESCRIPTION

The GWF Tracy Project is a modification to the existing 169-megawatt (MW) simple cycle power plant on 10.3 acres within the 40-acre parcel owned by GWF. The modification would add: two heat recovery steam generators (HRSG), a net 145 MW steam turbine generator (STG), an air-cooled condenser system (ACC), a natural gas-fired auxiliary boiler, a STG lube oil cooler, a new 400,000 gallon fire/service water storage tank, a nominal 300 horsepower diesel-fired emergency firewater pump, a new overhead transmission line, and a new storm water evaporation-percolation (retention) basin. Approximately 12.3 acres of the property would be used for construction laydown and parking. Upon completion, the GWF Tracy plant would occupy approximately 16.4 acres of the parcel (GWF2008a).

WATER RESOURCES

GWF is requesting delivery of a raw surface water supply from the Byron-Bethany Irrigation District (BBID) for industrial process water and other non-potable water uses. The source of this supply would be the Bureau of Reclamation's (Reclamation) Central Valley Project (CVP). The water would be delivered via the Delta-Mendota Canal using the existing 12-inch pipeline developed for the original project. A local bottled-water vendor would supply the facility with potable drinking water. GWF did not provide information on the source of water for sanitary needs. It is assumed that water for sanitary needs like hand washing and eye washing would continue to be provided to GWF Tracy using methods currently used at TPP.

The raw surface water supplier, BBID, is a public agency operating under the California Water Code. BBID is a multi-county special district encompassing approximately 19,000 acres, with lands in Alameda, Contra Costa and San Joaquin Counties and is the jurisdictional water purveyor in the area (CEC, 2003).

Water Supply During Construction

GWF Tracy will rely on the existing connection to the Delta Mendota Canal at the TPP site for construction water. GWF is expecting an average daily use of about 2,000 gallons per day. GWF will use no more than 12,000 gallons per day for site grading and excavation. GWF proposes to use water of a quality equal to or better than existing surface runoff for construction. The primary use of construction water would be to spray on the soil in construction areas prior to completion of permanent soil loss control measures. GWF will also use a maximum of 80,000 gallons of water for pipeline/tank hydrostatic testing.

Project Water Supply

BBID's water distribution system includes two divisions: the Byron Division (north of the SWP intake channel) and the Bethany Division (south of the SWP intake channel) each of which draw water from the Clifton Court Forebay. The SWP provides urban and agricultural water to two-thirds of California residents; 70% of SWP customers are urban users. The SWP draws its water through the Skinner Fish Screen into the intake channel and the water is then pumped into the California Aqueduct via the Banks Pumping Plant. From a separate point of diversion, the CVP draws its water through the Tracy Fish Screen into its intake channel and the water is then pumped into the Delta-Mendota Canal via the Tracy Pumping Plant (CEC, 2003a).

The Delta-Mendota Canal was completed in 1951 as part of the federal CVP. The Delta-Mendota Canal has the capacity to deliver approximately three million acre-feet of water annually from water supplied by the U.S. Bureau of Reclamation (Reclamation) from the Sacramento and San Joaquin River Basins and is operated and maintained by the San Luis & Delta-Mendota Water Authority (SLDMWA). This 116-mile canal carries water southeasterly along the west side of the San Joaquin Valley from the Tracy Pumping Plant to the Mendota Pool about 30 miles west of Fresno, CA (San Luis & Delta-Mendota Water Authority website – www.sldmwa.org) (CEC, 2002B).

The Delta-Mendota Canal and California Aqueducts, supported by various storage reservoirs, convey nearly 6,000,000 acre-feet per year (AFY) of municipal, industrial and agricultural water to the southern portion of California and play a significant role in the movement of water throughout the state. An estimated 1,700,000 AFY of water from the Delta is diverted by local water users under existing entitlements. For example, in its comments at the evidentiary hearing for the original TPP the Contra Costa Water District (CCWD) notes that the Delta is their sole source of water supply for 430,000 people (CEC, 2003).

Approximately 87 gallons of water per minute (gpm) would be used at GWF Tracy: 37 gpm of raw water from BBID and 50 gpm of plant process recycled water. This average daily use would support fire protection, evaporative cooling of intake air, heat recovery steam generator (HRSG) makeup, auxiliary boiler makeup, steam turbine lubricating oil

wet surface air cooler (WSAC), washing the combustion turbine compressors, and miscellaneous plant uses. In total, with an operation of 8,000 hours/year at full plant output requiring an average of 37 gpm of raw water, 54.4 AFY of water would be utilized (GWF2008a). Maximum water requirements for these processes (based on 98° F ambient temperature) would be about 249 gpm: 156 gpm of raw water from BBID and 93 gpm of plant process recycled water. **Soil and Water Resources Table 3** describes the daily and annual water uses within the proposed GWF Tracy site.

Soil and Water Resources Table 3
Estimated Daily and Annual Water Use for GWF Tracy Operations

Water Use	Water Source	Average Daily Use (gpm)	Maximum[a] Daily Use (gpm)
Power Plant Water Demand			
Raw Water	Delta-Mendota Canal Plant Process Return Flow	37[c]	156
Plant Process (Recycle) Water		50	93
Approximate Operational Use			
Demineralized Water	Delta-Mendota Canal Plant Process Return Flow	46[b]	70[b]
Evaporative Cooler		21[d]	49[d]
Steam Turbine Lubricating Oil Cooling		7[d]	95[d]
Plant Service Water (Intermittent Use)		<1	<1

[a] Maximum water requirements are based on 98° F ambient temperature.
[b] Demineralized water used for HRSG makeup, intermittent auxiliary boiler makeup, and turbine wash water.
[c] Average Annual Use at 37 gpm for 8,000 hours per year equal to 54.4 acre-feet per year
[d] Daily use lost to evaporation
Table edited from Source: GWF2008a.

Water Quality

The water quality delivered from the Delta-Mendota Canal has not changed from the original TPP 2001 AFC. **Soil and Water Resources Table 4** documents the water quality of CVP's Delta-Mendota Canal.

Soil and Water Resources Table 4
Delta-Mendota Canal Water Quality Parameters
(Unfiltered mg/L Unless Otherwise Indicated)

Constituent	Water Quality (mg/L)
Alkalinity, as calcium carbonate[3]	129.3
Conductivity[2]	749.17 µmhos/cm
Hardness, as calcium carbonate[1]	102.00
Total dissolved solids[2]	416.67
Aluminum[2]	1.07
Barium[2]	0.053
Cadmium[2]	<0.0001
Calcium[3]	40.7
Chloride[3]	140.0
Chromium[2]	<0.01
Copper[2]	0.0021
Iron[2]	1.25
Lead[2]	<0.001
Manganese[2]	0.116
Magnesium[3]	21.8
Nickel[2]	<0.05
Nitrate[3]	2.1
Selenium[2]	<0.001
Silica[3]	20.0
Sodium[3]	120.0
Sulfate[3]	120.0
Zinc[2]	<0.01
Bromodichloromethane[1]	52.5
Bromoform[1]	3.075
Chloroform[1]	112.8
Dibromoclorometh ane[1]	22.00

[1]Sampled at O'Neill intake on 1/5/00, 2/3/00, 3/2/00, 4/4/00, 5/3/00, 5/30/00, 7/6/00, 8/2/00, 9/5/00, 10/3/00, 10/31/00, 12/6/00

[2]Sampled at Mile Post 9.87 on 6/23/92, 7/14/92, 8/18/92, 10/9/92, 11/5/92

[3]Reported by the Bureau of Reclamation, 2001

Source: GWF, 2001.

Water Treatment

The raw water supply from the Delta-Mendota Canal would be treated onsite for use at GWF Tracy. The treatment process would include a microfiltration system, multistage reverse osmosis system, and a portable demineralized water system to provide high quality water suitable for use in the combustion turbine evaporative coolers, make up for the HRSGs, and other plant uses. Demineralized water is also used for combustion turbine generator (CTG) washing. Service water would be used for the STG WSAC lube oil cooler as well as other plant uses in the service and fire water systems. Given the increased water demand for GWF Tracy, staff expects the volume of water treated will increase above TPP levels.

Wastewater Collection, Treatment, Discharge and Disposal

The plant would be a near-zero wastewater discharge facility. A wastewater recovery system would be used to reduce the volume of wastewater produced by the plant. The remaining industrial wastewater, approximately 0.05 gallon per minute, would be stored in a 10,000 gallon tank onsite and periodically transported via licensed haulers for offsite recycle or disposal. TPP currently transports wastewater to McKittrick Waste Treatment site, a Class II liquid waste landfill in Kern County (CEC, 2001) for disposal.

Sanitary wastewater would be handled through an existing 1,500 gallon septic tank and 1,000 square-foot leach field system (GWF2008a). The leach field is ¼ to ½ mile from the nearest groundwater well. The depth to shallow groundwater at this site is 10 to 25 feet below the ground surface; however, the groundwater near Tracy can vary from 30 to 200 feet below ground surface (GWF2008e).

According to the draft Storm Water Pollution Prevention Plan (SWPPP), all GWF Tracy domestic sanitary wastewater generated during construction would be collected in portable self-contained chemical toilets and disposed offsite by a licensed contractor (GWF2008a).

Plant Drain and Oil/Water Separator

General plant drains would collect containment area washdown and discharge to sample and facility equipment drains. Water from these areas would be collected in a system of floor drains, hub drains, sumps, and piping and routed to the facility wastewater collection system.

Drains that could contain oil or grease would first be routed through an oil/water separator and then discharged to the existing 10,000 gallon holding tank. Industrial wastewater from combustion turbine water washes would also be collected in holding tanks or sumps and would be trucked offsite for disposal at the McKittrick Waste Treatment site (GWF2008a).

Stormwater Runoff and Drainage

The GWF Tracy site is located on terrain that slopes from the southwest to the northeast. Stormwater runoff historically drained as sheet flow in that direction. The Delta-Mendota Canal, the closest surface water body, borders the western property boundary where it is elevated above the adjacent grade of the site. The canal essentially prevents rainfall runoff from reaching the site from offsite areas west of the canal (CH2M2008f).

The existing TPP site contains a stormwater retention basin sized for two successive 100-year, 24-hour storm volumes. The retention basin is located near the center of the site and collects runoff from the existing plant. The retention basin relies on evaporation and percolation to recover capacity. This retention basin would be resized and relocated as part of the GWF Tracy expansion.

Areas within the 40-acre GWF property, to the north of the TPP facilities, were previously used as a laydown area during construction of the existing plant. Following construction, this land was converted to a vegetated field with no impervious surfaces. Runoff from this area drains as sheet flow, offsite to the northeast. This area would again be used as a laydown area for construction of the GWF Tracy project. This disturbed area would drain to a sedimentation basin planned near the northern-most property boundary where one was located for the TPP during construction.

Groundwater

GWF Tracy would not utilize groundwater during construction or operation. The plant buildings and associated paved areas would be impervious to infiltration, locally reducing infiltration under these areas and facilities. All plant stormwater runoff will be collected and conveyed to a retention basin, where infiltration would occur. Contact stormwater would be directed to the holding tanks and trucked offsite.

SOIL RESOURCES

The soil mapping units in the GWF Tracy area are approximately level soils formed on old terraces from sandstone and shale. These soils are moderately well- to well-drained. The factors that have the largest potential effect on soil loss include steep slopes, lack of vegetation, and erodible soils composed of large proportions of fine sands. The soils at the site are considered to have relatively high water erosion potential and moderate wind erosion potential due to the slow permeability and the clay loam content of the Stomar soil. The presence of expansive clays in the soil may affect its suitability as a bearing surface for foundations and pipelines. **Soil and Water Resources Table 5** summarizes the native soil characteristics at GWF Tracy.

Soil and Water Resources Table 5
Soil Characteristics at GWF Tracy Project Site

Primary Soil Name	Slope Class	Shrink-Swell Capacity	Water Erosion Potential	Wind Erosion Potential	Permeability	Land Capability Class
Capay Clay	0 to 2 %	High (Linear Extensibility >6)	Relatively High	Moderate	Slow to very slow	2s (irrigated) 4s (non-irrigated)
Stomar Clay Loam	0 to 2 %	High (Linear Extensibility >6)	Relatively High	Moderate	Slow	2s (irrigated) 4s (non-irrigated)

Source: GWF2008a

Due to the developed nature of the site, however, it is likely that soil conditions could vary from those mapped. The previous development of the TPP site likely entailed significant mixing with non-native soils because of the potential expansive behavior of the native soils. These soils would have to be suitable for compaction to support structures and roadways (GWF2008a).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section provides a discussion of the potential direct, indirect, and cumulative impacts to soil and water resources that may result from construction, operation, and maintenance of the proposed TPP. While all projects would likely have impacts, the goal is to limit any adverse impacts to an insignificant or acceptable level, or to avoid them altogether, if possible. Staff's analysis of potential impacts consists of a brief description of the potential impact, an analysis of the relevant facts, and application of the threshold criteria for significance to the facts. Mitigation measures may be necessary to reduce potentially significant impacts to a level of insignificance. If mitigation is warranted, staff provides a summary of GWF's proposed mitigation and a discussion of the adequacy of the proposed mitigation. Where necessary, staff presents additional or alternative mitigation measures or recommends specific conditions of certification related to a potential impact and any required mitigation measures.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff evaluated the potential impacts to soil and water resources including the effects of construction and operation activities that could result in erosion of soils, the deposition of sediments into surface waters or the contamination of either groundwater or surface water. Staff also evaluated the potential of the project's proposed water use to cause a significant depletion or degradation of local and regional water resources.

To evaluate if significant impacts to soil or water resources would occur, staff assessed:

- Whether construction or operation would lead to accelerated wind or water erosion and sedimentation.
- Whether the project would exacerbate flood conditions in the vicinity of the project.
- Whether the project's water use would cause a substantial, or potentially substantial, adverse change in the quantity or quality of groundwater or surface water.
- Whether project construction or operation would lead to degradation of surface or groundwater quality.
- Whether the project would comply with all applicable LORS.

These criteria are based on the California Environmental Quality Act (CEQA) Guidelines and performance standards (CCR 2008). The threshold of significance for project impacts is based on the ability of the project to be built and operated without violating applicable erosion, sedimentation, flood, surface or groundwater quality, water supply, or wastewater discharge standards. The federal, state, and local LORS and policies presented in **Soil and Water Resources Table 1** represent the applicable standards used for the GWF Tracy analysis. These LORS support a comprehensive regulatory system, with adopted standards and established practices designed to prevent or

minimize adverse impacts to soil and water resources. For those impacts that exceed standards or result in a significant adverse impact, conditions of certification may be necessary to ensure compliance with standards or reduce the impacts to a less than significant level.

Staff's analysis, determination of potential impacts, and evaluation of appropriate mitigation measures relies on estimates and information provided by GWF regarding the construction and operation of GWF Tracy. Applicable scientific, technical, and LORS/policy-related literature and expert opinion was also consulted in the development of staff's analysis.

DIRECT/INDIRECT IMPACTS AND MITIGATION

This direct and indirect impact and mitigation discussion is divided into impacts related to construction and to operation. For each potential impact evaluation, staff briefly describes the potential effect and applies the threshold criteria for significance to its analysis of the project. If mitigation is warranted, staff provides a summary of GWF's proposed mitigation and a discussion of the adequacy of the proposed mitigation. In the absence of GWF's proposed mitigation or if mitigation proposed by GWF is inadequate, staff mitigation measures are recommended. Staff also provides specific conditions of certification related to a potential impact and the required mitigation measures.

Construction Impacts and Mitigation

Construction of GWF Tracy would include soil excavation, grading, installation of utility connections and the use of water, primarily for dust suppression. Potential impacts to soils related to increased erosion or release of hazardous materials are possible during construction. "Low threat discharges" from hydrostatic testing could also result in minor water quality impacts. Potential stormwater impacts could result if increased runoff flow rates and volume discharges from the site were to increase flooding downstream. Water quality could be impacted by discharge of eroded sediments from the site, discharge of hazardous materials released during construction, or migration of any existing hazardous materials present in the subsurface soil and groundwater. Project water demand during construction could affect groundwater or surface water resources. Potential construction related impacts to soil, stormwater, and water quality or quantity, including the applicant's proposed mitigation measures and staff's proposed mitigation measures are discussed below.

Erosion Control and Stormwater Management

Construction activities for managing erosion and stormwater must be addressed to avoid potential adverse impacts to water quality and soil resources. Accelerated wind and water-induced erosion may result from earth-moving activities associated with construction of the proposed project. Alteration of the soil structure leaves soil particles vulnerable to detachment and removal by wind or water. Soil erosion can cause the loss of topsoil and can increase the sediment load in surface receiving waters downstream of areas affected by construction activity. Increasing the amount of impervious surfaces would increase the amount of runoff and peak discharges. Runoff from stormwater can also convey contaminants to soil, groundwater, and surface water if hazardous materials and waste are not properly stored, handled, and disposed.

Construction activity would increase short-term soil erosion. With the implementation of Best Management Practices (BMPs) including stabilizing construction entrances, applying water for dust suppression, placement of silt fencing, berms, and hay bales as needed, and conveying all stormwater to a retention basin or sedimentation basin, erosion would be reduced to less than significant and water quality would not be adversely affected by runoff from the site.

Staff was unable to read the grading plan for the laydown area (Figure 1.1-4, GWF2008a) and the construction figures for the laydown area provided in the Draft Construction SWPPP. Additionally, GWF did not provide calculations for the sizing of the construction sedimentation basin north of the laydown area. Therefore, staff recommends GWF Tracy design the construction sediment basin to meet standards in the California Stormwater Best Management Practices Construction Handbook (CASQA, 2003a) as well as the County of San Joaquin Stormwater Quality Control Criteria Plan (San Joaquin, 2003). To mitigate potential impacts, the sediment basin would have 1.0-foot of freeboard and provide an additional 25% of the calculated volume for sediment. The sediment basin would be sized to incorporate the entire 12.3-acre laydown area plus any additional project area that would have an interruption to its serviceable storm drain network and retention basin. Staff would consider that no additional tributary area is required if GWF Tracy can plan the service interruption during the dry season. Optionally GWF Tracy may identify other temporary sedimentation facilities in their final construction SWPPP.

Staff recommends two conditions, **SOIL & WATER-1 & -2,** which address mitigation measures designed to reduce any soil erosion and stormwater construction impacts to less than significant levels.

Condition of Certification **SOIL & WATER-1** would require the project owner to comply with all of the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity, including the development and implementation of a SWPPP for Construction. The SWPPP requires GWF to present design calculations for the construction sediment basin.

To qualify for the NPDES statewide General Permit for Storm Water Discharges Associated with Construction Activity (General Construction Permit), prior to construction GWF Tracy would be required to develop a SWPPP to prevent the offsite migration of sediment and other pollutants, and to reduce the effects of runoff from the laydown sites to offsite areas. Successful implementation of the SWPPP would ensure that construction impacts to soil resources are mitigated to a less-than-significant level. SWPPP procedures include submitting a Notice of Intent (NOI) to the State Water Resources Control Board (SWRCB) and developing the SWPPP prior to the start of construction activities. The construction SWPPP would also be submitted to the San Joaquin County Stormwater Management Engineer for review. Staff requests (in **SOIL & WATER-2**) that GWF provide calculations for the proposed retention and sediment basins so that staff can evaluate compliance with the General Construction Permit.

Staff recommends that sufficient storage be maintained in the retention and sediment basins to collect runoff from all disturbed onsite areas. The construction sequence of

taking the existing retention basin offline, installing a modified drainage network, and constructing the new retention basin should be described in the Drainage, Erosion, and Sediment Control Plan (DESCP) project schedule recommended by staff in Condition of Certification **SOIL & WATER-2**. Condition of Certification **SOIL & WATER-2** requires the project owner to obtain Compliance Project Manager (CPM) approval for a site-specific final DESCP that addresses all project elements and ensures protection of soil and water resources for the construction and operation phases of the project.

Temporary Erosion Control Measures

Temporary erosion control measures would be implemented at the start of construction, and would be evaluated, inspected and maintained during construction. GWF suggests these BMP measures would include silt fences, temporary sediment basins, culverts, and mulching. These measures would be removed from the site after the completion of construction or converted to permanent BMPs.

During construction of the project, dust erosion control measures would be implemented to minimize the wind-blown loss of soil from the site. GWF states that water of a quality equal to or better than existing surface runoff would be sprayed on the soil in construction areas to control dust.

Sediment barriers slow runoff and trap sediment. Sediment barriers would be placed around sensitive areas to prevent contamination by sediment-laden water near areas such as wetlands, creeks, or storm drains. Sediment barriers include straw bales, sand bags, straw wattles, and silt fences. They would be placed downstream of disturbed areas, at the base of exposed slopes, and along streets and property lines below the disturbed area.

GWF would place some sediment barriers in locations where offsite drainage could occur to prevent sediment from leaving the site. Sediment barriers are to be properly installed (staked and keyed), then removed or used as mulch after construction. Any soil stockpiles, including sediment barriers around the base of the stockpiles, would be stabilized and covered.

Staff recommends that GWF Tracy not remove the sedimentation basin, north of the construction laydown area, until the land draining to it has been returned to pre-existing conditions and has established a sufficient vegetated cover. This re-vegetation requirement should be included in the construction SWPPP as specified in Condition of Certification **SOIL & WATER-1** required for LORS compliance.

Laydown Areas

The area proposed for the GWF Tracy construction laydown is approximately 12.3 acres and would be located on previously disturbed areas used to construct the TPP facility. This laydown area is located immediately north of the PG&E right of way. In the Commission Decision for the TPP, the remaining 29.7 acres of the 40-acre site, which includes the laydown area, was to be leased to a local farmer. The farmer was to have had the capacity to provide irrigation water from allocations other than the TPP site's claim to the entire 136 acre-feet per year (CEC, 2001). The structure of the surface soil in this area was altered during the original site construction. Agricultural activity would have returned the laydown area to pre-existing conditions following construction.

There are nearly level conditions at the site and laydown areas; however, the soils are expected to have slow to very slow permeability (and consequently, high runoff). It is assumed that 100% of the GWF Tracy laydown area would be exposed during grading. GWF expects the laydown area to be graded within one month and then, to prevent subsequent wind erosion losses, the **AIR QUALITY** Conditions of Certification **AQ-SC1** to **AQ-SC8** will be implemented.

Vehicle traffic and equipment staging would result in soil compaction in the laydown area. Soil compaction increases soil density by reducing soil pore space. This, in turn, exacerbates the ability of the soil to absorb precipitation and transmit gases for respiration of soil microfauna. Soil compaction can result in increased runoff, erosion, and sedimentation. GWF proposes to store heavy equipment on dunnage (loose scrap material that provides ventilation) to protect it from ground moisture. Compaction beneath the laydown area can also be mitigated by removing and stockpiling topsoil for later reuse and by deep ripping the subsoil after removing the material and gravel covering. Given the limited area over which permanent compaction would occur, it is considered that this impact would be less than significant. It is also assumed that soil loss would be negligible from the laydown areas once it is covered.

The highest potential for soil loss would occur immediately following grading or during the period following the end of construction. GWF has described the existing laydown area as bare soil and that the laydown area would be returned to its current condition. Given the planned construction activity at the site, it is likely that the soil structure in this area may be significantly changed. Staff recommends that the temporary sedimentation basin for the laydown area remain active during the entire construction period. This would require inspection and maintenance to mitigate potential impacts caused by runoff from the exposed unvegetated surface. With the implementation of Condition of Certification **SOIL & WATER-1** and **SOIL & WATER-2**, staff believes any potential significant adverse impacts caused by erosion or storm water discharge during construction of the project would be mitigated. Staff concludes GWF has not provided sufficient analysis for non-industrial areas impacted by construction. Staff recommends that GWF's DESCP address the entire 40-acre site to ensure non-industrial use areas do not cause significant impacts to soil and water resources after construction has been completed.

Existing Utilities

Access to the project site from the laydown area would require construction road access across the existing PG&E 42-inch gas line right of way. The PG&E pipe must maintain adequate cover during and after construction. If required by PG&E, the pipeline alignment would be appropriately identified and signage displayed so that the pipeline is not exposed or impacted by construction activities.

Water Supply

The primary use of water for construction is dust control and pipeline/tank hydrostatic testing. Water used for dust control and soil compaction during construction would not result in discharge. Wastewater from these activities would be discharged to an existing holding tank for transport offsite. Wastewater not collected for offsite disposal

would be required to comply with Central Valley RWQCB's Resolution No. R5-2008-0182 or obtain a Waiver of Reports of Waste Discharge in accordance with Resolution No. R5-203-0008.

GWF's source of their construction water is from BBID. GWF estimated the annual average and maximum construction water use to be 416,000 and 2.5 million gallons, respectively. Total construction water totals 7.9 acre-feet. Raw water from BBID used by TPP and GWF Tracy construction would not exceed the current TPP annual allocation for water.

Groundwater

According to DWR's Water Data Library, wells monitored in the Tracy area since 2005 suggest the groundwater table is roughly 6 to 16 feet below ground surface. During construction, the GWF Tracy site would not directly impact groundwater resources with the implementation of Condition of Certification **SOIL & WATER-1.** The construction SWPPP would provide specific guidelines for protecting groundwater resources should groundwater be encountered during construction. Staff recommends GWF Tracy provide dewatering procedures in the construction SWPPP to mitigate potential impacts to groundwater resources.

All non-contact stormwater would drain into the temporary sedimentation basins, which would be designed according to Central Valley Regional Water Quality Control Board (CVRWQCB) standards. The runoff in these basins will percolate into the ground to recharge local groundwater supplies. All contact stormwater will be collected and stored in a holding tank and eventually trucked offsite for disposal at the McKittrick Waste Treatment site (GWF2008a).

Wastewater and Sanitary Waste

During the construction period, GWF states that all sanitary waste would be collected in portable toilets (no discharge) supplied by a licensed contractor for collection and disposal at an appropriate receiving facility. Equipment wash water would also be collected and disposed of offsite; therefore, there would be no impacts from disposal of sanitary wastewater. Staff recommends GWF Tracy handle the wastewater from hydrostatic testing similar to the handling of the equipment wash water. Handling, storing and disposal of all construction wastewater would be fully described in the construction SWPPP; required as part of Condition of Certification **SOIL & WATER-1**.

Operational Impacts and Mitigation

Operation of GWF Tracy could lead to potential impacts to soil, stormwater runoff, water quality, water supply, and wastewater treatment. Soils may be potentially impacted through erosion or the release of hazardous materials used in the operation of GWF Tracy. Stormwater runoff from the GWF Tracy site could result in potential impacts if increased runoff flow rates and volumes discharged from the site increase downstream flooding. Water quality could be impacted by discharge of eroded sediments from the GWF Tracy site, or discharge of hazardous materials released during operation. Water supply for plant processes, cooling, fire protection and landscape irrigation could lead to potential quantity or quality impacts to regional groundwater or surface water resources. Potential impacts to soil, stormwater, water quality, water supply, and wastewater related to the operation of GWF Tracy, including the applicant's proposed mitigation measures and staff's proposed mitigation measures, are discussed below.

Stormwater

The project site, when completed, would be partially covered with impervious surfaces, which would increase runoff during moderate and large storm events. The existing onsite drainage system would be modified to route GWF Tracy stormwater runoff to the proposed retention facility to be located near the western property boundary entrance to the plant. GWF plans to design the retention basin for twice the volume generated during a 25-year, 24-hour storm event. The sequence of taking the existing facility offline and interrupting service of the conveyance system should be included in the schedule and described in the GWF Drainage Erosion and Sediment Control Plan recommended by staff in Condition of Certification **SOIL & WATER-2**. Staff recommends the above plan and schedule be designed to ensure that the stormwater improvements occur during the dry season and prevent accidental stormwater discharge from the site.

No hydrologic calculations were provided to support the drainage plan for the site. The GWF Tracy Draft Construction SWPPP did not include the supporting documents that staff required to conduct an adequate review of the site drainage network and retention pond. The SWPPP design calculations and power plant site layout, delineating the sub-watersheds, overland flow, stormwater collection system, site grading, and BMP locations were not submitted for staff's review.

GWF suggests that the grading and drainage of the proposed plant was designed in accordance with the Improvement Standards for San Joaquin County (San Joaquin County Improvement Standards, 1997). The Standards require that the evaporation/percolation basin be sized for at least two successive, 10-year, 24-hour storm event volumes.

According to the Improvement Standards for San Joaquin County, the retention pond storage volume is determined using the following formula (Equation 1):

$$V_p = 2.0 * CA\left(\frac{R}{12}\right)$$

where V_p is the required retention pond storage volume, C is the runoff coefficient, A is the contributing area in acres, and R is the total rainfall in inches for a given duration.

The runoff coefficient for industrial areas varies between 0.70 and 0.85 (San Joaquin County Improvement Standards, 1997). The planned tributary area for the retention pond is the operational GWF Tracy site of 16.38 acres. The remaining acreage of the GWF Tracy 40-acre parcel would follow historical patterns to the northeast. The total 10-year, 24-hour rainfall, R, for Tracy is 1.85 inches (Miller, *et al.* 1973).

The GWF Tracy retention facility would be sized for back to back 25-year, 24-hour storms that yield 2.25 inches of rainfall each (Miller, *et al.* 1973). Evaporation and percolation are intended to restore the retention pond's design volume. There would be no planned discharges from the retention pond. **Soil and Water Resources Table 6** provides summary calculations for the range of V_p values that would be applicable to the GWF Tracy operational site. Staff has tested two runoff coefficients for industrial sites to assess what may have been presumed by GWF.

Soil and Water Resources Table 6
Range of applicable V_p calculations

Storm Event	Source / Reference	Volume Multiplier	*C*	*A* (acres)	*I* (inches)	V_p (acre-ft)
10-yr, 24-hr	AFC	2	0.70	16.38	1.85	3.63
	AFC	2	0.85	16.38	1.85	4.41
25-yr, 24-hr	SJC, Equation 1	2	0.70	16.38	2.25	4.40
	SJC, Equation 1	2	0.85	16.38	2.25	5.34
100-yr, 24-hr[1]	CVRWQCB Equation 2	1	0.70	16.38	2.95	2.82
	CVRWQCB Equation 2	1	0.85	16.38	2.95	3.42

[1] Note: V_p calculated for single 100-yr, 24-hr storm volume.

GWF Tracy did not include retention basin sizing calculations in the Draft Construction SWPPP but stated that the basin would be constructed to retain 4.40 acre-feet. According to staff's assessment, a volume of 4.40 acre-feet meets the retention basin standards for San Joaquin County. The requirements also require freeboard. The CVRWQCB requires zero discharge facilities to retain stormwater volumes up to the level of a 100-year, 24-hour storm event (CVRWQCB, 2009). The following formula (Equation 2) represents the CVRWQCB sizing requirements for the retention facility,

$$V_p = CA\left(\frac{R}{12}\right)$$

which accounts for a single event – requiring no multiplier. Staff found the 4.40 AF retention volume to be adequate for storage of a single 100-year, 24-hour volume.

Stormwater in the retention pond would percolate in to the ground or evaporate. **Soil and Water Resources Table 7** below includes average pan evaporation rates anticipated for the site based on Stockton, California data from the California Department of Water Resources' Agroclimatic Monitoring in the San Joaquin Valley 1958-1991. Based on staff's review of the double ring infiltrometer results provided in GWF's data response, the typical percolation rate is expected to be between 2.25 cm/hr (0.89 in/hr) to 4.50 cm/hr (1.77 in/hr). In order to maintain this infiltration rate, the California Stormwater BMP Handbook suggests the removal of accumulated sediment and regrading of the pond when the accumulated sediment volume exceeds 10% of the basin. Additionally, to avoid reversing soil development, scarification or other disturbance should only be performed when there are actual signs of clogging, rather than on a routine basis (CASQA, 2003b).

Soil and Water Resources Table 7
Expected Pan Evaporation Rates for the GWF Tracy Site

Month	Normalized Monthly Evaporation Rates (Stockton, CA) (inches/month)
January	1.35
February	2.29
March	4.29
April	5.81
May	8.53
June	9.84
July	10.29
August	8.59
September	6.76
October	5.69
November	2.43
December	1.21

Source: CH2M2008f: Table 10 of California Department of Water Resources' Agroclimatic Monitoring in the San Joaquin Valley 1958-1991

The GWF Tracy AFC did not provide a description of the surficial area of the proposed retention pond. In order to assess the retention pond's ability to recover storage volume, staff assumed the retention pond area was at least 1.15 acres. Given the volume of 4.40 acre-feet, the depth of the design storage would be approximately 3.8 feet. At a percolation rate of 0.89 in/hr, staff anticipates that the pond would recover 46% of its design volume in 24 hours. Staff recommends that GWF include one foot of freeboard as part of the final retention pond design. Freeboard is a design requirement of the CVRWQCB's policy on zero discharge facilities. Staff also recommends GWF identify the location of the emergency spillway and the direction of flow to provide overflow for

events that exceed the pond capacity on plans that would be included in the Drainage Erosion and Sediment Control Plan recommended by staff in Condition of Certification **SOIL & WATER-2**.

GWF has not sufficiently addressed permanent BMPs for areas of the 40-acre site that are not part of the GWF plant, after construction activities have ceased. Staff recommends that a permanent sedimentation basin be maintained to sufficiently manage runoff from the non-plant areas, especially the area that would be twice used for construction laydown. To avoid potential significant erosion impacts from this area staff recommends that this area be re-vegetated. Condition of Certification **SOIL & WATER-2** would require the project owner to prepare a Drainage Erosion and Sediment Control Plan that includes specific drainage design calculations for the storm drain network, permanent stormwater BMPs, and provide guidance for monitoring and maintenance activities to ensure the plant facility and non-facility areas of the GWF Tracy site will not cause significant impacts to adjacent properties.

GWF has included design features to isolate stormwater (non-contact) from hazardous materials and equipment. Liquids storage areas are designed with spill containment. Condition of Certification **SOIL & WATER-3** requires the project owner comply with all requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity, including the development and implementation of an operational SWPPP. Condition of Certification **SOIL & WATER-6** requires that the project owner not discharge wastewater, other than non-contact stormwater, and provide evidence that industrial wastewater and contact stormwater is being disposed of at an appropriately licensed facility. No significant surface or groundwater related impacts are expected as attributable to industrial wastewater and contact stormwater collection and disposal if the project owner complies with these two conditions of certification.

GWF has designed the project so that all stormwater would drain to a retention pond or would be disposed of offsite. The GWF Tracy retention facility should be sized to meet the San Joaquin Stormwater Quality Control Criteria (San Joaquin, 2003) and the criteria established by the CVRWQCB for zero (stormwater) discharge facilities. Implementing a zero discharge program allows GWF to avoid permitting required by the CVRWQCB under the General Permit to Discharge Storm Water Associated with Industrial Activity (SWRCBWQ Order No. 97-03-DWQ). In order to obtain this exemption, GWF would be required to submit a Notice of Non-Applicability (NONA) with the CVRWQCB prior to mobilization at the site to allow notice that the site would not require a General Stormwater Permit. The NONA constitutes notice that the facility operator believes they are exempt from the industrial permit requirements. Should the CVRWQCB determine that GWF Tracy requires a General Stormwater Permit, GWF Tracy would need to implement an industrial SWPPP to prevent or control pollutants potentially associated with the operation of the plant from entering onsite storm drains in accordance with the DESCP. GWF Tracy would require inspections and monitoring (including sampling) to be conducted per the requirements of the statewide General Permit.

The project site is not located in an area identified as a flood hazard zone. Staff believes that with the implementation of Conditions of Certification **SOIL & WATER-1, SOIL & WATER-2,** and **SOIL & WATER-3** the potential for offsite impacts from flooding are less than significant.

The project site is also located adjacent to the Delta Mendota Canal. The levees of the Delta-Mendota canal are not fail-safe. Levee failure would mean disruption to the water management system, and if the breach occurred near the Tracy Plant, the site could be temporarily inundated with water from the canal. Levee failure is unlikely because the canal does not carry flood flows and it is maintained by BBID.

Expansive Soils

Capay clay and Stomar clay loam at the project site are moderately fine- and fine-textured soils derived from sandstone and shale. They both have smectitic mineralogy with high shrink-swell capacities and are considered to be expansive clays. While these soils could affect the foundation and roadways for the proposed expansion of this facility, the previous development of the TPP likely entailed significant mixing and the addition of non-native soils during grading and construction to allow for suitable compaction and support for the current structures on site. Recommendations for mitigating the effects of expansive clays soils must be provided in the project-specific geotechnical report as required by CBC (2007) requirements and proposed **FACILITY DESIGN** Conditions of Certification **GEN-1**, **GEN-5,** and **CIVIL-1**.

Groundwater

The GWF Tracy site would not directly impact groundwater resources. The onsite evaporation/ percolation basin would only receive noncontact stormwater, and, therefore, would not cause an impact on local and regional groundwater quality or quantity.

The use of groundwater could have a potential adverse effect due to local drawdown of the groundwater table. Groundwater was considered as an alternative water source in the TPP AFC; however, the notion was dismissed due to the increased environmental impacts and costs associated with drilling a well onsite. The TPP Condition of Certification **SOIL & WATER-4** from the TPP Commission Decision (CEC, 2002b) prohibited the use of groundwater and required the project owner to report their water usage. Likewise, Staff recommends Condition of Certification **SOIL & WATER-4** which prohibits the project owner from pumping or purchasing groundwater for GWF Tracy use.

Wastewater and Sanitary Waste

GWF proposes two separate wastewater collections systems for GWF Tracy: one for sanitary wastewater and one for industrial wastewater. Sanitary wastewater would be routed to the existing onsite 1,000 gallon septic tank and leach field for all sanitary wastes from toilets, sinks, and showers. According to the California Plumbing Code (CBSC, 2007) and using criteria for an industrial facility with no showers or cafeteria, the septic tank would provide a minimum of 637.5 gallons of storage for domestic wastewater produced by 17 employees. Additionally, the leaching area required for this volume of wastewater is about 670 square-feet. Staff believes the existing septic tank and leach field

are conservatively-sized and satisfactory for the expected GWF Tracy demand. Staff proposes **SOIL & WATER-5** which would ensure there would be no impacts from the changed use of the existing sanitary septic disposal facility.

Industrial wastewater generated from the operation of the plant would be collected and stored in the onsite holding tank and periodically transported from the site by a licensed hauler to a licensed facility. Plant drainage including leakage and drainage from facility containment areas would be collected in a system of floor drains, sumps, and pipes within GWF Tracy, discharged to an oil/water separator, and released into the onsite holding tank. GWF also proposes a wastewater recovery system that would be used to reduce the volume of wastewater produced by the plant and provide a supply for other process needs. The system would consist of a packaged ion exchange/filtration/reverse osmosis system. It will be used to reclaim wastewater from the reverse osmosis treatment for demineralilzed water makeup, and blowdown from the HRSG and wet surface air cooler water. The amount of water reclaimed during the annual average water balance cycle is approximately 58% of the total water demand (GWF2008a Figure 2.1-5B). For example: The annual average water balance shows BBID canal water demand at 37 gpm and recycled water at 50 gpm: [50/(37+50) = 58%]. Staff believes this system of wastewater management would be adequate to protect surface and groundwater resources from impacts due to potential industrial wastewater discharges.

Water Supply

GWF Tracy proposes to use high quality, raw water from the BBID. BBID has a long-term water service agreement with Reclamation for approximately 20,600 acre-feet of CVP water (Reclamation, 2005). BBID also receives raw water from the State Water Project (SWP). BBID had water demands of 31,700 acre-feet in 2000, and in 2003, demand was expected to be 49,000 acre-feet in 2010 (CEC, 2003a).

GWF Tracy's ownership of the overall 40-acre parcel equates to a potential right to 136 AFY (GWF2008a) of CVP water during years when Reclamation allows full allocations. GWF Tracy stated incorrectly in the AFC that allocations are "138 AFY" in Section 2.2.7.2. TPP proposed use of nearly 30 acre-feet per year for maximum level of operation. The GWF Tracy project proposes a maximum annual use of 54.4 AFY (CEC, 2002b). The proposed increase in water supply is within the site's allocation limits. Staff has reviewed the July 31, 2001 Will-Serve letter from Plain View Water District (now BBID) identifying that the GWF Tracy property will be served at a 100% allocation of 136 acre-feet of water (or 3.4 acre-feet per acre) each year in which Reclamation makes available to the District its entire contract entitlement of 20,000 acre-feet. A follow-up letter from BBID reiterates the District's commitment to providing the annual water service to GWF Tracy. BBID confirmed that they have the ability and can meet the GWF Tracy demand through their current water service contract with Reclamation (Reclamation, 2005). According to the Plain View Water District (now BBID) Will Serve letter, dated July 31, 2001, "In years in which Reclamation is unable to provide the District their full contract amount, each landowner's allocation is reduced proportionately" (PVWD, 2001).

The expanded GWF Tracy plant would require a peak water delivery of approximately 156 gpm from the water service connection to the Delta-Mendota Canal. GWF Tracy does not propose to modify the existing water service connection and 12-inch service

line to GWF Tracy. This water service connection is owned and operated by GWF Tracy. Staff was not provided the detailed as-built drawings for the water service connections but has determined that the 12-inch diameter pipeline would have the capacity for the increased demand. BBID has agreed that, “Based on the size of the line, the line and meter are both capable of the additional demand.” (BBID 2009a, Rick Gilmore, email correspondence, January 19, 2009).

The CVP, operated by Reclamation, transports approximately 20% of the state’s developed water. The CVP supplies water to agricultural, municipal, and wildlife refuge customers throughout the San Joaquin Valley. Reclamation has reduced the annual allocation of CVP water to its customers, including BBID, over the past two years due to drought conditions and limits placed on the pumping from the Delta for protection of environmental resources. BBID has in return reduced the annual allocation of water to its contractors. In the year 2009, allocations were reduced to 15% of contract entitlement for agricultural users and 65% for municipal and industrial (M&I) users. BBID has identified GWF Tracy allocations as equal to the CVP M&I restrictions (BBID 2009b). Given the current year allocations BBID could have delivered 88.4 acre-feet to GWF Tracy. Reductions of 40% to M&I users would be required to limit the allocation to GWF Tracy to the maximum need of 54.4 AFY.

GWF Tracy provided the annual water usage data for the TPP site operations in Data Response 36 (CH2M 2008f). Between 2003 and 2008, TPP’s average use of 1.16 AFY has been much less than the fully authorized annual authorization granted by the Energy Commission in the Commission Decision for TPP (CEC, 2002b). Given the new configuration of GWF Tracy it is anticipated water use will change and could increase significantly from past use.

In the service agreement between BBID and Reclamation (Reclamation, 2005), it is recognized that the water delivery system may experience interruptions in service. Also, a ‘Condition of Shortage’ due to drought, unscheduled repairs (canal failures) or scheduled routine maintenance, errors in physical operation, or a physical failure of the system may prevent BBID from receiving the full entitlement from the CVP. A condition of shortage results from over-drafting of the normal water supply. The condition is aggravated by negative precipitation and below normal stream flow or recharge. The “induced” drought is brought about by introducing agricultural, recreational, industrial or residential consumption into an area which cannot naturally support them. During a condition of shortage or interruption in service, Reclamation may direct BBID to reduce the allocation to its water users. **Soil and Water Resources Table 8** shows the percent of M&I entitlement delivered by Reclamation over the past 11 years (Source: http://www.westlandswater.org).

Soil and Water Resources Table 8
Allocation History for M&I Entitlements

Year	Percent of Entitlement
1998	100
1999	95
2000	90
2001	75, 77 after 10/19/2001
2002	90, 95 after 09/10/2002
2003	95, 100 after 07/01/2003
2004	90, 95 after 09/13/2004
2005	90, 95 after 04/15/2005, 100 after 04/28/2005
2006	90, 100 after 04/20/2006
2007	75
2008	75

Staff investigated the potential interruptions in service that may result from BBID maintenance operations. BBID claims “there have not been any interruptions in service or outages in the Delta-Mendota Canal other than temporary planned outages for maintenance. The canal is never completely drained, operating levels are lowered. At this time there are not any planned interruptions scheduled” (BBID, 2009a). Staff also requested that GWF Tracy describe changes to the plant operations and procedures when there are interruptions in service from BBID, since no backup water source has been identified. Back-up water and operations are discussed below.

The use of BBID raw water would not cause a significant impact on other water users or on the quality of other waters. However, this water source does not comply with state water policy regarding the use of fresh inland water. See the discussion of this issue in the Compliance with LORS section. Staff is recommending Condition of Certification **SOIL & WATER-4** to limit the GWF Tracy to maximum water use of 54.4 acre feet per year. **SOIL & WATER-4** requires the project owner to submit monthly water usage to confirm the site is in compliance of the annual water use limit.

Backup Water

Currently GWF Tracy does not propose to obtain a backup source or an alternative source of water and would rely solely on deliveries from BBID for its annual demand. GWF’s discussion of alternative sources of water and backup water in the AFC was amended during the data adequacy phase and was discussed in the data response workshop.

If GWF Tracy were allocated a supply of water less than the anticipated average annual water consumption, GWF Tracy plans to modify equipment operations which would include reducing water consumption to the WSAC and the combustion turbine generator (CTG) inlet air evaporative coolers (CH2M 2008f).

BBID has also indicated they may have access to additional water sources from other purveyors, including the State Water Project that can be used to meet customer demand. According to BBID, GWF Tracy would be able to request additional raw water to meet its demand if Reclamation were to limit its allocation. According to BBID, ”The source of the supplemental supply is the District’s CVP supply. We set aside a certain amount of water on a case by case basis each year” (BBID, 2009a). Staff is concerned that this supply is speculative; however, since BBID has confirmed constant service in the Delta Mendota Canal, staff believes this is a reliable water source for GWF Tracy (BBID, 2009b). Further analysis of water supply is also discussed in the **RELIABILITY** section of the FSA.

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts consist of impacts that may occur as a result of the proposed project in combination with impacts from other past, present and reasonably foreseeable future projects. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

Temporary and permanent disturbances associated with construction of the proposed project would cause accelerated wind- and water-induced erosion. However, staff has concluded that the implementation of proposed mitigation measures, the SWPPP and the DESCP would ensure that the project would not contribute significantly to cumulative erosion and sedimentation impacts.

The industrial wastewater and contact stormwater from the GWF Tracy site would be routed to an onsite holding tank and hauled offsite for disposal at a licensed facility. All sanitary waste would be discharged into the existing TPP septic tank / leach field. Therefore, no wastewater-related cumulative impacts are expected. The stormwater discharge would be retained on site and would not exacerbate flooding conditions in the area.

GWF Tracy would use a maximum of 54.4 AFY of raw water supplied from the BBID. BBID’s and all other CVP contractors have been granted entitlements by Reclamation based on a complex system of water rights and agreements that ensure there are no cumulatively significant impacts to other upstream and downstream users or environmental resources. All CVP water users receive supplies based on the need to meet requirements for protection of these resources. Staff does not consider the project’s use of the BBID water in combination with other uses of this water to be a cumulatively significant impact.

BBID has confirmed that no adverse effects are expected to downstream water rights as a result of this increase (approximately 25 AFY) demand. BBID’s response to staff’s inquiry included the following response, “the additional demand will not impact any other user of the Delta-Mendota Canal or water user within the District. As long as the District provides water to its customers within its contract allotment, there is no impact.”
No significant cumulative impacts are expected to result from the GWF Tracy project. The GWF Tracy project would not receive additional allocations of water for construction and operational use on the 40-acre site. The quantity of water needed for operation of GWF Tracy is relatively minor because of GWF’s proposed use of dry cooling technology. The GWF Tracy site would not contribute to offsite runoff quality or quantity,

nor affect groundwater since it would be operating with zero discharge. Soils not covered by the plant buildings, pavement, and ancillary improvements would not be changed over the long-term. GWF Tracy would not contribute to a cumulative soil and water resources impact.

COMPLIANCE WITH LORS

The Energy Commission's power plant certification process requires staff to review each of the proposed project's elements for compliance with LORS and policies. Staff has reviewed the project elements and concludes that the proposed GWF Tracy project would comply with all applicable LORS addressing protection of water resources, storm water management, and erosion control, as well as drinking water, use of freshwater, and wastewater discharge requirements, as long as staff's proposed conditions of certification are adopted and implemented. Summary discussions of project compliance with significant LORS and policies are provided below.

STORMWATER

Clean Water Act

Staff has determined that the GWF Tracy project would satisfy the requirements of the General National Pollutant Discharge Elimination System permit with the adoption of Conditions of Certification **SOIL & WATER-1 and -3**, which requires the development and implementation of SWPPPs for construction and industrial activity.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

Staff has concluded that GWF Tracy would satisfy the applicable requirements of the Porter-Cologne Water Quality Control Act and adequately protect the beneficial uses of waters of the state through implementation of federal, state, and local requirements for management of storm water discharges and pollution prevention and compliance with local grading and erosion control requirements, and compliance with local onsite wastewater treatment system (septic system) requirements.

SWRCB Policy 75-58 and Energy Commission—Integrated Energy Policy Report (IEPR)-Power Plant Water Use and Wastewater Discharge Policy

In accordance with the water conservation provisions established in the California State Constitution and SWRCB Resolution 75-58, the Energy Commission established a water source and use policy in its *2003 Integrated Energy Policy Report (IEPR)*, stating that "the Energy Commission will approve the use of fresh water for cooling purposes by power plants which it licenses only where alternative water supply sources and alternative cooling technologies are shown to be 'environmentally undesirable' or 'economically unsound'."

GWF Tracy proposes to use fresh water for evaporative cooling of intake air and a WSAC for lubricant oil cooling. However, GWF Tracy also proposes to use an alternative cooling technology to reduce the amount of water required for plant operation: an air-cooled condenser system (ACC). The ACC has a higher capital cost

but will conserve more water compared to typical wet cooling technologies. Staff concurs with GWF Tracy that the use of an ACC is an economically sound practice that provides environmental benefits from significantly reduced water use.

The fresh water will be provided by BBID which receives its water allocations from Reclamation as part of their CVP entitlements. These annual entitlements are conditioned by Reclamation in the service agreement between BBID and Reclamation (Reclamation, 2005). During periods of shortage BBID may receive less than the full entitlement from the CVP. A condition of shortage results from over-drafting of the normal water supply, which may be precipitated by drought conditions. During a condition of shortage or interruption in service, Reclamation may direct BBID to reduce the allocation to its water users, which in turn would limit and regulate the GWF Tracy raw water allocations to ensure no environmental impacts.

Staff reviewed the East Altamont Energy Center (EAEC) (Docket No. 01-AFC-4) and the Tesla Power Plant (Tesla PP) (Docket No. 01-AFC-21) documents on the use and availability of recycled water supplies. These two facilities are planned in the vicinity of GWF Tracy. In the case of the EAEC, the Commission accepted the judgment of BBID that sufficient supplies of fresh water would be available to meet all district needs, including EAEC, without the use of recycled water. The Commission also noted that it is to the benefit of all parties to find a cost effective manner of utilizing the increasing amounts of recycled water that would result from development in the district.

Staff has reviewed the recycled water issues at EAEC and the Tesla PP and investigated the current recycled water availability since these two applications were reviewed by the Energy Commission. According to Rick Gilmore, BBID's General Manager, "Recycled water is currently not available (to BBID), however it could be in the future by BBID or the City of Tracy."

Staff discussed the availability of recycled water with Steve Bayley, Deputy Director of Public Works for the City of Tracy on December 30, 2008 and again on March 24, 2009. Mr. Bayley explained that the closest access point for GWF Tracy to the City's recycled water is at 3900 Holly Drive in Tracy, CA. Mr. Bayley said the Tracy Wastewater Treatment Plant produces tertiary treated, Title 22 water adequate for industrial cooling use at GWF Tracy. Mr. Bayley also discussed a past investigation for the Tesla Power Plant, regarding its investigation of potential recycled water from Tracy. Mr. Bayley mentioned two other proposed electrical power generation projects that have requested recycled water from the City of Tracy: the Mulqueeney Ranch Pumped Storage Project in the Patterson Pass foothills area; and a proposed power generation facility on Roberts Island in San Joaquin County. Both projects are considering recycled water from the Tracy wastewater treatment plant. Mr. Bayley said the City does not have the resources to construct the infrastructure for recycled water distribution.

The Tracy Wastewater Treatment Plant is less than seven miles from GWF Tracy. Staff reviewed several potential alignments for the recycled pipeline from the Tracy Wastewater Treatment Plant to GWF Tracy. The shortest feasible alignment would require about five miles of pipeline construction within urban areas with the total distance equal to roughly six miles. Pipeline alignments around urban areas would require a longer distance but there would be less environmental impacts to existing

infrastructure. The feasibility of any route would require ownership agreements with the City of Tracy and a significant assessment of the easements and rights of way needed for construction.

The appliciant has stated that the costs to trench city streets, install pipe, and repave city streets would be economically and environmentally unfeasible. (GWF2008a). Pipeline construction would cause significant environmental impacts related to trenching of streets and property along the selected pipeline alignment and subsequent installation of the infrastructure. These construction related impacts include construction equipment noise and air pollution, soil losses from wind and water, and construction water use. Environmental impacts would be exacerbated by road closures and traffic delays and other typical construction related impacts. Staff concurs that the economical and environmental costs associated with the construction of this infrastructure for the sole use of GWF Tracy is unreasonable compared to no change to the infrastructure currently serving the site.

Mr. Bayley agreed with GWF Tracy that there would be high capital cost compared to the amount of recycled water that would be used at GWF Tracy. Mr. Bayley also believed there would be environmental impacts associated with building the appropriate infrastructure to supply recycled water to GWF Tracy. Mr. Bayley mentioned that the City would likely update their City of Tracy Water Master Plan within the next few years. The update would include a specific discussion of the availability of recycled water from the Tracy wastewater treatment plant for potential users in the “sphere of influence”. GWF Tracy would be within the “sphere of influence” covered by the Master Plan document. The master plan would provide a key resource for GWF Tracy to determine where recycled water infrastructure is being planned, when it would be available, so that environmental and economic costs associated with recycled water can be determined. Mr. Bayley also mentioned that it is not likely that the local water districts, including BBID, are considering recycled water supplies from the Tracy wastewater treatment plant.

GWF Tracy has not provided any acknowledgement that the plant would use recycled water if it becomes feasible to supply to the site. Staff believes that at some time in the future recycled water may become reasonably available and economically feasible to deliver during the life of the project. Given current conditions however, staff concludes that GWF Tracy is in substantial compliance with the State Water Resources Control Board’s Policy 75-58 and Energy Commission water policy since there is no economically feasible or environmentally desirable alternatives to the proposed freshwater use.

In addition, the Energy Commission’s water policy also seeks to protect water resources from power plant wastewater discharges. To that end, the water policy specifies that the Energy Commission will require zero liquid discharge technologies (for management of power plant wastewaters) unless such technologies are shown to be ‘environmentally undesirable’ or ‘economically unsound.’ GWF Tracy proposes to use a “near zero” liquid discharge system where sanitary waste will be handled on site with a septic tank and leach field. Contact stormwater and plant industrial wastewater would be routed to an onsite storage tank and hauled offsite and properly disposed. Therefore, staff finds that

the wastewater management would be in compliance with the intent of the water policy because it eliminates the significant portion of process wastewater discharge from the facility.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments on Soil and Water Resources were received.

NOTEWORTHY PUBLIC BENEFITS

Neither GWF Tracy nor staff has identified any noteworthy benefits to soil or water resources that would be provided by the project.

CONCLUSIONS

Based on its assessment of the proposed GWF Tracy Combined Cycle Power Plant (GWF Tracy) project, staff concludes the following:

- Implementation of Best Management Practices (BMPs) during GWF Tracy construction and operation in accordance with effective SWPPPs and a DESCP would avoid significant adverse effects that could be caused by transport of sediments or contaminants from the GWF Tracy site and associated linear facilities by wind or water erosion.
- Stormwater runoff from all disturbed areas of the 40-acre site would not cause significant impacts with the implementation of sedimentation basins that remain active throughout construction and the subsequent period necessary for non-industrial use areas to become sufficiently re-vegetated.
- The proposed fresh water supply for the project would not cause a significant adverse environmental impact on current or future users of the water supply.
- The proposed use of a freshwater supply would be consistent with state water policy found in State Water Resources Control Board (SWRCB) Resolution 75-58, and the Energy Commission's 2003 Integrated Energy Policy Report (IEPR) water policy because there is no economically feasible or environmentally desirable alternative.
- GWF Tracy has proposed the use of an alternative cooling technology which is environmentally desirable and economically feasible.
- The proposed project would be constructed to comply with 100-year flood requirements and would not exacerbate flood conditions in the vicinity of the project.
- The discharge of sanitary wastewater to a septic tank / leach field discharge system would not degrade surface or groundwater quality.
- The proposed project would comply with all applicable federal, state and local laws, ordinances, regulations and standards with the adoption of the recommended conditions of certification.
- GWF Tracy would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources with adoption of the conditions of certifications.

Staff concludes that GWF Tracy project would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources and would comply with all applicable LORS if all of the recommended conditions of certification are adopted by the Commission and implemented by GWF Tracy.

PROPOSED CONDITIONS OF CERTIFICATION

SOIL & WATER-1: The project owner shall comply with the requirements of the General National Pollutant Discharge Elimination System (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 GWF Tracy Combined Cycle Power Plant Project (GWF Tracy). The construction SWPPP shall include a requirement which excludes the removal of the sedimentation basin, north of the construction laydown area, prior to the return of sufficient vegetated cover (to pre-existing conditions) to the land area which drains to it.

Verification: The project owner shall submit a copy of the construction SWPPP to the San Joaquin County Stormwater Management Engineer for review. The project owner shall submit copies to the compliance project manager (CPM) of all correspondence between the project owner and the Central Valley Regional Water Quality Control Board (RWQCB) regarding the General NPDES permit for the discharge of storm water associated with construction activities within 10 days of its receipt (when the project owner receives correspondence from the RWQCB) or within 10 days of its mailing (when the project owner sends correspondence to the RWQCB). This information shall include copies of the Notice of Intent and the Notice of Termination sent to the State Water Resources Control Board for the project construction.

SOIL & WATER-2: Prior to site mobilization, the project owner shall obtain CPM approval for a site-specific Drainage, Erosion, and Sedimentation Control Plan (DESCP) that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operation phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in offsite flooding potential, meet local requirements, and identify all monitoring and maintenance activities. Additionally, the plan shall incorporate the construction sequence of taking the existing retention basin offline, installing a modified drainage network, and constructing the new retention basin. Monitoring activities shall include routine measurement of the volume of accumulated sediment in the stormwater retention basin. Maintenance activities must include removal of accumulated sediment from the retention basin when an average depth of 0.5 feet of sediment has accumulated in the retention basin. The plan shall be consistent with the grading and drainage plan as required by Condition of Certification CIVIL-1. The DESCP shall contain the following elements. All maps shall be presented at a legible scale.

- ***Vicinity Map*** – A map shall be provided indicating the location of all project elements with depictions of all significant geographic features to

include watercourses, washes, irrigation and drainage canals, and sensitive areas.

- ***Site Delineation*** – The site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.
- ***Watercourses and Critical Areas*** – The DESCP shall show the location of all nearby watercourses including washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to the construction site.
- ***Drainage*** – The DESCP shall include hydrologic calculations for onsite areas and offsite areas that drain to the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, and show all existing, interim, and proposed drainage infrastructure and their intended direction of flow. Provide hydraulic calculations to support the selection and sizing of the drainage network, retention facilities and best management practices (BMPs). Spot elevations shall be required where relatively flat conditions exist. The spot elevations and contours shall be extended off site for a minimum distance of 100 feet in flat terrain or to the limits of the offsite drainage basins.
- ***Clearing and Grading*** – The plan shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCP shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.
- ***Project Schedule*** – The DESCP shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). Separate BMP implementation schedules shall be provided for each project element for each phase of construction.
- ***Best Management Practices*** – The DESCP shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction.

- ***Erosion Control Drawings*** – The erosion-control drawings and narrative shall be designed, stamped, and sealed by a professional engineer or erosion-control specialist.

Verification: No later than 90 days prior to start of site mobilization, the project owner shall submit a copy of the DESCP to San Joaquin County for review and comment. A copy shall be submitted to the CPM no later than 60 days prior to the start of site mobilization for review and approval. The CPM shall consider comments received from San Joaquin County. During construction, the project owner shall provide an analysis in the monthly compliance report on the effectiveness of the drainage-, erosion- and sediment-control measures and the results of monitoring and maintenance activities. Once operational, the project owner shall provide in the annual compliance report information on the results of stormwater BMP monitoring and maintenance activities.

SOIL & WATER-3: The project owner shall comply with 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 the site. The project owner may also submit a Notice of Non-Applicability (NONA) to the RWQCB to apply for an exemption to the general NPDES permit.

Verification: At least 30 days prior to commercial operation, the project owner shall submit copies to the CPM of the operational SWPPP for the GWF Tracy site. Within 10 days of its mailing or receipt, the project owner shall submit to the CPM any correspondence between the project owner and the RWQCB about the general NPDES permit for discharge of storm water associated with industrial activity. This information shall include a copy of the notice of intent sent by the project owner to the State Water Resources Control Board and the notice of termination. A letter from the RWQCB indicating that there is no requirement for a general NPDES permit for discharges of storm water associated with industrial activity would satisfy this condition.

SOIL & WATER-4: Water used for project operation for process, sanitary and landscape irrigation purposes shall exclusively be raw surface water from Byron-Bethany Irrigation District (BBID). Pumping or purchasing groundwater is prohibited. Water use shall not exceed the annual water-use limit of 54.4 acre-feet per year. The project owner shall monitor and record the total water used on a monthly basis. For calculating the annual water use, the term "year" will correspond to the date established for the annual compliance report submittal.

Prior to using raw surface water for process needs, the project owner shall install and maintain metering devices as part of the water supply and distribution systems to monitor and record, in gallons per day, the total volume(s) of water supplied to GWF Tracy from BBID. Those metering devices shall be operational for the life of the project.

For the first year of operation, the project owner shall prepare an annual Water Use Summary, which will include the monthly range and monthly average of daily raw surface water usage in gallons per day, and total water

used by the project on a monthly and annual basis in acre-feet. For subsequent years, the annual Water Use Summary shall also include the yearly range and yearly average water use by the project. The annual Water Use Summary shall be submitted to the CPM as part of the annual compliance report.

Verification: At least sixty (60) days prior to commercial operation of GWF Tracy, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on the water supply and distribution systems. When the metering devices are serviced, tested and calibrated, the project owner shall provide a report summarizing these activities in the next annual compliance report. The project owner, in the annual compliance report, shall provide a Water Use Summary that states the source and quantity of raw surface water used on a monthly basis and on an annual basis in units of acre-feet. Prior annual water use including yearly range and yearly average shall be reported in subsequent annual compliance reports.

SOIL & WATER-5: The project owner shall comply with the requirements of the San Joaquin County Code, Title 9, Division 11: Infrastructure Standards and Regulations, Private Onsite Wastewater Disposal Facilities Regulations regarding a Sanitation Permit for sanitary waste disposal facilities including GWF Tracy's septic system and leach field.

Verification: The project owner shall submit all necessary information and the appropriate fee to county of San Joaquin – Environmental Health Division and request their review and comment on the permit application. The project owner will provide any comments to the CPM. The CPM will determine whether the project has complied with the county's sanitary waste disposal facilities requirements and provide written approval for development and use of the disposal facility.

SOIL & WATER-6: The project owner shall not discharge wastewater, other than non-contact stormwater, and shall provide evidence that industrial wastewater and contact stormwater is being disposed of at an appropriately licensed facility.

Verification: The project owner shall provide evidence of industrial wastewater and contact stormwater disposal, via a licensed hauler, to an appropriately licensed facility in the annual compliance report.

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TRAFFIC AND TRANSPORTATION

Testimony of Scott Debauche

SUMMARY OF CONCLUSIONS

Staff has analyzed the traffic-related information provided in the Application for Certification (AFC) and other sources to determine the potential for the GWF Energy LLC Tracy Combined Cycle Power Plant Project (GWF Tracy) to have significant adverse traffic- and transportation-related impacts. Staff has also assessed the availability of mitigation measures that could reduce or eliminate the significance of these impacts.

Construction of GWF Tracy will add traffic to local roadways during the construction period. This increase in traffic could impact existing traffic load and capacity of the street system. In addition, construction activities could result in impacts to emergency access, encroachment on railway facilities, damage to public roadways, and introduce oversize and overweight vehicles on the local street system. Once GWF Tracy is operational, traffic volumes generated from it would be minimal and insignificant on the local transportation network; however, project operation exhaust turbines and air cooler thermal plumes could pose aviation hazards to low-flying aircraft using Tracy Municipal Airport. If the California Energy Commission (Energy Commission) elects to grant certification for this project, staff is proposing four conditions of certification. These conditions of certification are recommended to prevent significant adverse traffic and transportation-related impacts from GWF Tracy construction and operation and to ensure that the project would comply with all applicable laws, ordinances, regulations, and standards (LORS) pertaining to traffic and transportation. Energy Commission staff concludes that with implementation of proposed Conditions of Certification **TRANS-1** through **TRANS-4**, GWF Tracy would not generate a significant impact under the California Environmental Quality Act (CEQA) guidelines with respect to CEQA Appendix G issues, “Transportation and Traffic.”

INTRODUCTION

In the Traffic and Transportation section, staff addresses the extent to which GWF Tracy may affect the traffic and transportation system within the vicinity of the project site. This analysis focuses on whether construction and operation of GWF Tracy would cause traffic and transportation impact(s) under CEQA and whether the project complies with the applicable LORS.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Traffic and Transportation Table 1 provides a general description of adopted federal, state, and local LORS pertaining to traffic and transportation relevant to the proposed project.

Traffic and Transportation Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
Aeronautics and Space Title 14 Code of Federal Regulations (CFR), part 77 Objects Affecting Navigable Airspace (14 CFR 77)	Establishes standards for determining physical obstructions to navigable airspace; sets noticing and hearing requirements; and provides for aeronautical studies to determine the effect of physical obstructions on the safe and efficient use of airspace.
49 CFR, Subtitle B	Includes procedures and regulations pertaining to interstate and intrastate transport (including hazardous materials program procedures) and provides safety measures for motor carriers and motor vehicles that operate on public highways.
State	
California Vehicle Code (CVC), division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15	Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
California Streets and Highway Code, division 1 & 2, chapter 3 & chapter 5.5	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits.
California Street and Highway Code §§117, 660-711	Requires permits from California Department of Transportation (Caltrans) for any roadway encroachment during truck transportation and delivery.
California Street and Highway Code §§660-711	Requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.
San Joaquin County Regional Transportation Plan	Sets forth 8 goals and 36 objectives to improve transportation in San Joaquin County.
San Joaquin County General Plan Transportation Element	Specifies that “all county roadways shall operate at a Level of Service (LOS) C or better (except in a City sphere of influence where the City has adopted LOS D); intersections shall operate at an overall LOS D or better on minor arterials and roadways of higher classification; and LOS C on all other roads; all freeways and state highways shall operate at a LOS D or better.”
City of Tracy Municipal Code Article 7 (Restricted Streets) Sections 3.08.290, 300, and 310	Establishes truck routes within the City of Tracy, including designating particular roadways as truck routes and truck route restrictions.

SETTING

GWF Tracy site is located within the existing Tracy Peaker Plant (TPP) site. The Delta-Mendota Canal to the southwest, agricultural property to the south and east, and the Union Pacific Railroad to the north bind the property. Immediately north of the railroad is the Owens-Brockway glass container manufacturing plant and the Nutting-Rice warehouse. The Tracy Biomass power plant is approximately 0.6 mile to the northwest. The GWF Tracy site is accessed via an existing 3,300-foot asphalt-paved service road directed southward from W. Schulte Road (GWF 2008a, pp. 5.12-6 through 5.12-7).

CRITICAL ROADS AND FREEWAYS

Regional access to the GWF Tracy site is provided from the north and south via Interstate 5 (I-5), which is located east of the project site. West of the site, Interstate 580 (I-580) provides regional access to the project site from Alameda County. Interstate 205 (I-205) is an east-west freeway north of the project site. I-205 connects to I-5 northeast of the project site, and to I-580 northwest of the project site. West Schulte Road provides local access to the project site.

Existing Regional and Local Transportation Facilities

The following describes the main regional and local roadways that would be used for GWF Tracy construction and operational related traffic.

Interstate 5

I-5, east of the GWF Tracy site, is a major north-south freeway that extends from the Mexican border to the Canadian border, through California, Oregon, and Washington. I-5 is a major north-south regional transportation route through San Joaquin County. It is a four-lane freeway immediately south of its interchange with I-580 and six lanes wide immediately north of its interchange with I-205. According to traffic counts published by the California Department of Transportation (Caltrans) in 2006, I-5 carries approximately 23,200 daily vehicles near the junction with Route 33 in the City of Tracy (GWF 2008a, p. 5.12-7). Truck traffic accounts for approximately 34% of all trips on I-5 in the vicinity of Route 33 (GWF 2008a, p. 5.12-7).

Interstate 205

I-205, north of the GWF Tracy site, is bounded by I-580 in Alameda County to the west and by I-5 in San Joaquin County to the east. Within San Joaquin County, I-205 is a four-lane freeway, and in Alameda County, between I-580 and the San Joaquin County border, I-205 is five lanes (three lanes westbound to I-580). According to traffic counts published by Caltrans in 2006, I-205 carries approximately 112,000 daily vehicles near the junction with I-580 (GWF 2008a, p. 5.12-7). Truck traffic accounts for approximately 12% of all trips on I-205 in the vicinity of I-580 (GWF 2008a, p. 5.12-7).

Interstate 580

I-580, west of the GWF Tracy site, is a predominantly east-west freeway. I-580 runs diagonally in a northwest-southeast direction south of the project site in San Joaquin County. I-580 is a four-lane freeway extending from I-5 in San Joaquin County (north of the Stanislaus County border) to Alameda County, where it connects with I-205 west of

the San Joaquin County border. At the junction with I-205, I-580 widens to an eight-lane freeway and shifts to an east-west direction continuing through Alameda County. According to traffic counts published by Caltrans in 2006, I-580 carries approximately 152,000 daily vehicles near the junction with I-205 (GWF 2008a, p. 5.12-7). Truck traffic accounts for approximately 13% of all trips on I-580 in the vicinity of I-205 (GWF 2008a, p. 5.12-7).

West Schulte Road

West Schulte Road is an east-west undivided arterial with two to four lanes and bicycle lanes and sidewalks on some sections. The roadway has two lanes near the site entrance and four lanes west of MacArthur Drive. The section that extends from Central to Corral Hollow Road has on-street bicycle lanes. West Schulte Road is classified as a major arterial in the city of Tracy General Plan (GWF 2008a, p. 5.12-8).

Current Roadway Conditions

The roadways discussion below is based on information contained in the Traffic and Transportation section of the AFC, as well as traffic data from Caltrans.

Level of Service

To quantify the existing baseline traffic conditions, the study area roadways and intersections were analyzed in the AFC to determine their operating conditions. Based on the traffic volumes, the turning movement counts, and the existing number of lanes at each intersection, the volume/capacity (V/C) ratios and levels of service (LOS) have been determined for each intersection.

LOS is a qualitative measure describing operational conditions within a traffic stream. It is used to describe and quantify the congestion level on a particular roadway or intersection and generally describes these conditions in terms of such factors as speed,

Traffic and Transportation Table 2
Level of Service Criteria for Roadways

Level of Service	Volume/ Capacity	Description
A	0.00 – 0.60	Free flow; insignificant delays
B	0.61 – 0.70	Stable operation; minimal delays
C	0.71 – 0.80	Stable operation; acceptable delays
D	0.81 – 0.90	Approaching unstable flow; queues develop rapidly but no excessive delays
E	0.91 – 1.00	Unstable operation; significant delays
F	> 1.00	Forced flow; jammed conditions

Source: GWF 2008a, p. 5.12-9

Traffic and Transportation Table 3 summarizes LOS levels determinations for intersections based on delay times per the Caltrans HCM. For the GWF Project study intersections, LOS C during off-peak hours (delays of 20 to 35 seconds) is considered to be the limit of acceptable delay. LOS F represents the worst condition with gridlock and is typically unacceptable.

Traffic and Transportation Table 3
Level of Service Criteria for Intersections

Level of Service	Signalized Intersection Delay Per Vehicle (in Seconds)
A	≤ 10.0
B	>10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

Source: GWF 2008a, p. 5.12-11

Existing Conditions — Roadways

This analysis focuses on roadway segments during a typical weekday along the I-205 and I-580 freeways. **Traffic and Transportation Table 4** summarizes the existing (2008) characteristics of the roadway segments studied for the proposed GWF Tracy project.

Traffic and Transportation Table 4
Current (2008) Roadway Segment Characteristics

Roadway Segment	Street Classification	Lanes	Peak Hour Capacity	Percent Truck Traffic	Daily Demand
I-580 Eastbound (San Joaquin/Alameda County Line to Patterson Pass Road)	Freeway	2	4,000	16.1%	23,572
I-580 Eastbound (Corral Hollow Road to Route 132 Junction)	Freeway	2	4,000	12.5%	22,366
I-205 Eastbound (San Joaquin/Alameda County Line to Mountain House Parkway)	Freeway	2	4,000	10.3%	59,001
I-205 Eastbound (Mountain House Parkway to Old Route 50)	Freeway	2	4,000	10.3%	59,264
I-580 Westbound (Patterson Pass Road to San Joaquin/Alameda County Line)	Freeway	2	4,000	16.1%	23,572
I-580 Westbound (Corral Hollow Road to Route 132 Junction)	Freeway	2	4,000	12.5%	22,366
I-205 Westbound (San Joaquin/Alameda County Line to Mountain House Parkway)	Freeway	2	4,000	10.3%	59,001
I-205 Westbound (Mountain House Parkway to Old Route 50)	Freeway	2	4,000	10.3%	59,264

Source: GWF 2008a, p. 5.12-10

Traffic and Transportation Table 5 summarizes the existing (2008) daily traffic volumes and V/C ratios for the studied roadway segments. For purposes of this analysis, it was assumed that the peak hour capacity is 2,000 vehicles per hour per lane on freeway segments. As shown in Traffic and Transportation Table 4, the study area roadway segments currently operate at LOS C or better with the exception of segments along I-205, which operate at LOS F in the westbound direction during the morning peak and in the eastbound direction during the evening peak.

Traffic and Transportation Table 5
Current (2008) Daily Traffic Volumes and
Volume/Capacity Ratios for Roadway Segments

Roadway Segment	AM Peak Hour			PM Peak Hour		
	Demand	V/C	LOS	Demand	V/C	LOS
I-580 Eastbound (San Joaquin/Alameda County Line to Patterson Pass Road)	707	0.18	A	1,886	0.47	A
I-580 Eastbound (Corral Hollow Road to Route 132 Junction)	671	0.17	A	1,789	0.45	A
I-205 Eastbound (San Joaquin/Alameda County Line to Mountain House Parkway)	1,770	0.44	A	4,720	1.18	F
I-205 Eastbound (Mountain House Parkway to Old Route 50)	1,778	0.44	A	4,741	1.19	F
I-580 Westbound (Patterson Pass Road to San Joaquin/Alameda County Line)	1,650	0.41	A	943	0.24	A
I-580 Westbound (Corral Hollow Road to Route 132 Junction)	1,566	0.39	A	895	0.22	A
I-205 Westbound (San Joaquin/Alameda County Line to Mountain House Parkway)	4,130	1.03	F	2,360	0.59	A
I-205 Westbound (Mountain House Parkway to Old Route 50)	4,148	1.04	F	2,371	0.59	A

Source: GWF 2008a, p. 5.12-11
LOS: level of service; V/C: volume/capacity.

Current Conditions — Intersections

The study area analyzed in this report includes the following intersections:

- I-580 northbound ramps/Patterson Pass Road-Mountain House Parkway
- I-580 southbound ramps/Patterson Pass Road-Mountain House Parkway
- West Schulte Road/Lammers Road
- I-205 westbound ramps/Mountain House Parkway
- I-205 eastbound ramps/Mountain House Parkway
- I-580 westbound ramps/Corral Hollow Road
- I-580 eastbound ramps/Corral Hollow Road

Traffic and Transportation Table 6 summarizes the results of the existing morning and afternoon peak-hour LOS analysis for the study area intersections. All study area intersections operate at an acceptable LOS (LOS C or better), with the exception of the West Schulte Road/Lammers Road intersection (LOS F during both peak periods), the I-580 southbound ramps/Patterson Pass Road intersection (LOS E during the PM peak) and the I-205 eastbound ramps/ Mountain House Parkway (LOS E during the PM peak).

Traffic and Transportation Table 6
Existing (2008) Intersection Level of Service Summary

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (sec)	LOS	Delay (sec)	LOS
I-580 northbound ramps/Patterson Pass Road-Mountain House Parkway[a]	13	B	13	B
I-580 southbound ramps/Patterson Pass Road-Mountain House Parkway[b]	15	B	49	E
West Schulte Road/Lammers Road[c]	51	F	51	F
I-205 westbound ramps/Mountain House Parkway[d]	14	B	13	B
I-205 eastbound ramps/Mountain House Parkway[e]	15	B	40	E
I-580 westbound ramps/Corral Hollow Road[f]	13	B	11	B
I-580 eastbound ramps/Corral Hollow Road[g]	13	B	20	C

Source: GWF 2008a, p. 5.12-12
[a]Unsignalized intersection; delay and LOS reported for the northbound shared left and through movements only.
[b]Unsignalized intersection; delay and LOS reported for the southbound shared left and through movements only.
[c]Unsignalized intersection, all way stop-controlled.
[d]Unsignalized intersection; delay and LOS reported for the westbound shared left and through movements only.
[e]Unsignalized intersection; delay and LOS reported for the eastbound left-turn movement only.
[f]Unsignalized intersection; delay and LOS reported for the westbound left-turn movement only.
[g]Unsignalized intersection; delay and LOS reported for the eastbound shared left and through movements only.

RAILWAYS

There are two railroad facilities in the immediate vicinity of the GWF Tracy Site. A Union Pacific Railroad (UPRR) line runs east-west and is adjacent to the site's northern boundary. The Union Pacific line is used for occasional, infrequent freight deliveries. In addition to this UPRR line, a Western Pacific Railway line runs east-west and is located approximately one mile south of the project site.

BUS TRANSPORTATION

The San Joaquin Regional Transit District (RTD) operates 161 buses throughout the county, and allows the passengers to transfer to local bus services at hub points (GWF 2008a, p. 5.12-14). The RTD "Tracer" serves the city of Tracy (GWF 2008a, p. 5.12-15). The RTD Tracer service map found that the nearest bus route and stop are located approximately 1.8 miles east of the GWF Tracy site (Route B, Stop 5) (RTD 2008). Therefore, no local bus stops are in immediate proximity of the GWF Tracy site.

BICYCLES AND PEDESTRIANS

The city of Tracy 2005 Bikeways Master Plan recommends the upgrade of Schulte Road to a Class III Bikeway (GWF 2008a, p. 5.12-14). A future canal trail will run along West Schulte Road near South Lammers Road to I-205 (GWF 2008a, p. 5.12-14). This future bike path is over 2.0 miles east of the GWF Tracy site. Currently, no existing or

planned bicycle path facilities are located in the immediate vicinity of the GWF Tracy project site. West Shulte Road and existing access roads serving the GWF Tracy site do not contain pedestrian walkways. The nearest section of West Schulte Road that has on-street bicycle lanes extends from Central to Corral Hollow Road, approximately 1.2 miles east of the GWF Tracy site (GWF 2008a, p. 5.12-8). As the nearest residential development is approximately 1.2 miles east of the GWF Tracy site, no local pedestrian facilities are in immediate proximity of the project site.

AIRPORTS

The GWF Tracy site is approximately 2.5 miles northwest of the Tracy Municipal Airport (TCY). TCY is a general aviation airport with two runways, runway 8/26 oriented east/west and runway 12/30 oriented northwest/southeast (AirNav 2008). TCY is owned by the City of Tracy, and serves as an alternative to Stockton Metropolitan Airport (about 20 miles north of the project site) for business-related aviation, and serves agricultural and other general aviation activities (GWF 2008a, p. 5.12-15). For the one-year time frame ending July 17, 2005 (most recently published statistic), TCY handled approximately 164 operations a day, of which 65% is transient general aviation and 34% local general aviation (AirNav 2008). TCY does not contain an air traffic control tower and observes Visual Flight Rules (VFR) (Aspen 2008). The Federal Aviation Administration (FAA) Oakland Center Terminal Radar Approach Control (TRACON) controls TCY departures and landings (Aspen 2009a). Both TCY runways observe a recommended left turn traffic pattern (Aspen 2008). Runway 30 departures observing a left turn traffic pattern (west) directs aircraft toward the GWF Tracy site (Aspen 2008). The Runway 30 left turn traffic pattern is a recommended pattern only and no standard traffic pattern altitude is observed over the GWF Tracy site or in perimeter of Tracy Municipal Airport (Aspen 2009a). Due to the general aviation nature of TCY, departures from Runway 26 sometimes do not observe the recommended left turn traffic pattern and instead turn right, directing these aircraft to the GWF Tracy site as well (Aspen 2009a).

The FAA was contacted in December of 2008 to provided data including the number of overflights within, the airspace above the GWF Tracy site. In the FAA January 2009 response to staffs Freedom of Information Act (FOIA) request, the FAA indicated that overflight data for the GWF site was unavailable due to the volume of aircraft traveling on a daily basis that do not file a flight plan or utilize FAA Air Traffic Organization (ATO) services (FAA 2009b). Conversations with TCY by staff also did not yield any accurate data indicating overflights of the GWF Tracy site (Aspen 2009a). However, it was indicated by TCY that airspace over the GWF Tracy site does not contain any restrictions and low flying aircraft overflights can and possibly do occur on occasion (Aspen 2009a).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

To determine whether there is a potentially significant impact generated by a project, California Energy Commission (Energy Commission) staff reviews the project using the

criteria found in the CEQA Guidelines Appendix G Environmental Checklist and applicable LORS utilized by other governmental agencies. Specifically, staff analyzed whether the proposed project would do the following:

- Cause an increase in traffic that would be substantial in relation to the existing traffic load and capacity of the street system (i.e., would result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections or roadway segments);
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment, oversized vehicles);
- Result in inadequate emergency access;
- Result in inadequate parking capacity, and;
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

DIRECT/INDIRECT IMPACTS AND MITIGATION

Roadway and Intersection Levels of Service

Construction Impacts and Mitigation

Based on the construction data provided within the AFC, over the full 22 months of construction required for GWF Tracy, the number of daily construction workers in the peak construction month (Month 17) would be 398 and the number peak daily truck deliveries would be 224 (no heavy haul truck deliveries are expected during this phase). Month 17 would be the critical construction period when the highest total number of daily trips is anticipated. Therefore, estimated daily construction trips during Month 17 were used to determine potential impacts, as this would represent the worst-case construction traffic scenario. Although construction activities will typically occur between 6:00 A.M. and 6:00 P.M., Monday through Saturday, there is also a potential need for a second shift, probably between 3:00 P.M. and 11:00 P.M.

For purposes of this analysis, both the construction vehicle delivery and worker trips were converted to passenger car equivalent (PCE) trips consistent with the *Highway Capacity Manual* guidelines. A detailed breakdown of this determination and methodology is provided in the AFC (GWF 2008a, pp. 5.6-17 and 18). Traffic and Transportation Table 7 lists the estimate of total construction vehicle trip for GWF Tracy that would be generated during the peak construction period.

Traffic and Transportation Table 7
Estimated Average and Peak Hour Trip Generation
Peak Construction Period

	Average Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
		In	Out	Total	In	Out	Total
Total Construction Traffic in PCE	1,388[1]	387	29	416	29	387	416

Source: GWF 2008a, p.5.12-17
[1]Total Average Daily Trips includes off-peak construction related trips

Based on the construction vehicle trip calculations presented in Traffic and Transportation Table 7, an analysis was conducted in the AFC to determine the impacts of these construction vehicle trips on current levels of service for study area roadways and intersections. Traffic and Transportation Table 8 summarizes the current V/C ratios and LOS for roadway segments in the project vicinity that may be affected by the project during construction and compares them to V/C ratios and LOS anticipated with GWF Tracy construction vehicle traffic. As shown, all study area intersections will continue to operate at the same LOS as during the existing conditions with the addition of the project's peak construction traffic, except at the I-205 Westbound (San Joaquin/Alameda County Line to Mountain House Parkway) segment, where the LOS is projected to change from A to B during the PM peak period, which is still considered acceptable.

Traffic and Transportation Table 8
Current Roadway Segment Levels of Service and Levels Anticipated with Project

Roadway Segment	AM					PM				
	Current		With Project			Current		With Project		
	V/C	LOS	Trips	V/C	LOS	V/C	LOS	Trips	V/C	LOS
I-580 Eastbound (San Joaquin/Alameda County Line to Patterson Pass Road)	0.18	A	97	0.20	A	0.47	A	7	0.47	A
I-580 Eastbound (Corral Hollow Road to Route 132 Junction)	0.17	A	7	0.17	A	0.45	A	97	0.47	A
I-205 Eastbound (San Joaquin/Alameda County Line to Mountain House Parkway)	0.44	A	97	0.47	A	1.18	F	7	1.18	F
I-205 Eastbound (Mountain House Parkway to Old Route 50)	0.44	A	7	0.45	A	1.19	F	97	1.21	F
I-580 Westbound (Patterson Pass Road to San Joaquin/Alameda County Line)	0.41	A	7	0.41	A	0.24	A	97	0.26	A
I-580 Westbound (Corral Hollow Road to Route 132 Junction)	0.39	A	97	0.42	A	0.22	A	7	0.23	A
I-205 Westbound (San Joaquin/Alameda County Line to Mountain House Parkway)	1.03	F	7	1.03	F	0.59	A	97	0.61	B*
I-205 Westbound (Mountain House Parkway to Old Route 50)	1.04	F	97	1.06	F	0.59	A	7	0.59	A

Source: GWF 2008a, p. 5.12-19
*Degradation over the existing LOS.

Traffic and Transportation Table 9 identifies the current levels of service and the LOS anticipated with GWF Tracy construction vehicle traffic for critical intersections in the vicinity of the project. As shown, with the addition of the GWF Tracy project's peak construction traffic, all study area intersections will continue to operate at an acceptable LOS except at the I-580 eastbound ramps/Corral Hollow Road intersection, where the LOS is projected to change from C to E during the PM peak period, and both the I-580 southbound ramps/Patterson Pass Road and the I-205 eastbound ramps/ Mountain House Parkway intersections, which are projected to change from existing LOS E to LOS F with the addition of GWF Tracy project's peak construction traffic during the P.M. peak hour.

Traffic and Transportation Table 9
Current Intersection Levels of Service and Levels Anticipated with Project

Intersection	AM				PM			
	Current		With Project		Current		With Project	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
I-580 northbound ramps/Patterson Pass Road-Mountain House Parkway[a]	13	B	15	B	13	B	13	B
I-580 southbound ramps/Patterson Pass Road-Mountain House Parkway[b]	15	B	20	C*	49	E	52	F*
West Schulte Road/Lammers Road[c]	51	F	69	F	51	F	72	F
I-205 westbound ramps/Mountain House Parkway[d]	14	B	19	C*	13	B	15	C
I-205 eastbound ramps/Mountain House Parkway[e]	15	B	15	C*	40	E	87	F*
I-580 westbound ramps/Corral Hollow Road[f]	13	B	12	B	11	B	11	B
I-580 eastbound ramps/Corral Hollow Road[g]	13	B	13	B	20	C	44	E*

Source: GWF 2008a, p. 5.12-20
*Degradation over the existing LOS.
[a]Unsignalized intersection; delay and LOS reported for the northbound shared left and through movements only.
[b]Unsignalized intersection; delay and LOS reported for the southbound shared left and through movements only.
[c]Unsignalized intersection, all way stop-controlled.
[d]Unsignalized intersection; delay and LOS reported for the westbound shared left and through movements only.
[e]Unsignalized intersection; delay and LOS reported for the eastbound left-turn movement only.
[f]Unsignalized intersection; delay and LOS reported for the westbound left-turn movement only.
[g]Unsignalized intersection; delay and LOS reported for the eastbound shared left and through movements only.

As shown in Traffic and Transportation Tables 8 and 9, construction traffic would not significantly reduce the LOS of any study area roadway segments to an unacceptable level. However, construction traffic would impact the I-580 eastbound ramps/Corral Hollow Road intersection to an unacceptable LOS during the P.M. peak hour and further degrade the existing LOS at the I-580 southbound ramps/Patterson Pass Road and I-205 eastbound ramps/ Mountain House Parkway intersections. In addition to direct construction related trips, interconnecting GWF Tracy into the Pacific Gas and Electric (PG&E) system will require the reconductoring of several segments of transmission line. Intersections and roadway segments along the transmission line routes may be affected during construction. However, traffic impacts at intersections will be site-specific and temporary in duration. Therefore, staff is proposing Condition of Certification **TRANS-1,** which would require the applicant to prepare a Construction Traffic Control Plan prior to

construction in order to reduce the impact of a decreased LOS at these three intersections, as well as any disruptions to street segments and intersections during reconductoring activities, to the maximum extent feasible.

Operation Impacts and Mitigation

GWF Tracy operations would require on average 11 delivery truck trips per month (GWF Energy, p. 5.12-16). Therefore, the operations-related and maintenance-related traffic associated with the project is minimal and insignificant when added to major movements on freeways and local roadways. Therefore, staff finds that the GWF Tracy project operations would have no impact on study area roadways or intersection LOS. Consequently, no operations-related mitigation measures are required.

San Joaquin Council of Governments Regional Congestion Management Program

California State Proposition 111, passed by voters in 1990, established a requirement that urbanized areas prepare and regularly update a Congestion Management Program (CMP). The purpose of the CMP is to monitor the performance of the countywide transportation system, develop programs to address near-term and long-term congestion, and better integrate transportation and land use planning. The San Joaquin Council of Governments (SJCOG), as the designated Congestion Management Agency for the San Joaquin County region, must develop, adopt, and regularly update the CMP.

The 2007 SJCOG CMP identifies the I-5, I-205, and I-580 freeways as CMP roadways (SJCOG 2007). However, as discussed above, project-related construction and operational traffic would not impact any segment of these CMP roadways analyzed for the proposed GWF Tracy project. Therefore, no impacts to the CMP would occur from construction- or operational-related GWF Tracy project traffic. Consequently, no mitigation measures are required.

Airports

As described above in the environmental setting discussion of airports, aircraft using TCY Runway 30 standard departures observe a left turn traffic pattern (west) directing aircraft toward the GWF Tracy site (Aspen 2008). The Runway 30 left turn traffic pattern is a recommended pattern only and no standard traffic pattern altitude is observed over the GWF Tracy site or in perimeter of Tracy Municipal Airport (Aspen 2008). Due to the general aviation nature of TCY, departures from Runway 26 sometimes do not observe the recommended left turn traffic pattern and instead turn right, directing these aircraft to the GWF Tracy site (Aspen 2009a). It was indicated by TCY that airspace over the GWF Tracy site does not contain any restrictions and low flying aircraft overflights can and possibly do occur on occasion (Aspen 2009a). Therefore, potential impacts of the GWF Tracy thermal exhaust plumes to low flying aircraft could occur and are analyzed below.

GWF Tracy gas turbines/heat recovery steam generator (HRSG) and air cooled condenser cooling tower exhaust would result in thermal air plume velocities that could result in turbulence with the potential to affect aircraft maneuverability above the GWF Tracy site. A plume velocity analysis was conducted for GWF Tracy and is presented in detail as APPENDIX TT-1 of this Preliminary Staff Assessment. This analysis assumed worst-case meteorological conditions (cool temperatures and calm winds) and operating

conditions (gas turbines and cooling tower operating at full load). The worst-case airspace conditions used in the velocity calculations are a frequent natural occurrence and would presumably occur frequently during the life of the power plant and potentially when small aircraft fly above GWF Tracy site. Traffic and Transportation Table 10 lists the average plume velocity speed in meters per second (m/s) for both GWF Tracy gas turbine and cooling tower plumes above ground level (AGL).

Traffic and Transportation Table 10
Plume Average Velocity
Engine and Radiator Predicted Plume Velocities

	Gas Turbines Non-Duct Firing Plume Velocity (m/s)	Air-Cooled Condenser Duct Firing Plume Velocity (m/s)	Air-Cooled Condenser Non-Duct Firing Plume Velocity (m/s)
Height (ft)	**59°F**	**59°F**	**59°F**
300	6.18	--[a]	--[a]
400	4.78	7.12	6.29
500	4.15	6.93	6.19
600	3.77	6.60	5.91
700	3.51	6.28	5.63
800	3.30	6.01	5.39
900	3.14	5.77	5.18
1,000	3.01	5.56	4.99
1,100	2.90	5.38	4.83
1,200	2.80	5.21	4.68
1,300	2.71	5.07	4.55
1,400	2.64	4.94	4.44
1,500	2.57	4.82	4.33
1,600	2.51	4.71	4.23
1,700	2.45	4.61	4.14
1,800	2.40	4.52	4.06
1,900	2.35	4.44	3.99
2,000	2.31	4.36	3.92

[a] Within the jet phase of the plume and outside the bounds of the calculation.
Source: APPENDIX TT-1.

For purposes of this analysis, a vertical velocity of 4.3 m/s plume average velocity has been determined as the critical velocity of concern to light aircraft. For the gas turbine/HRSGs the height at which the combined plume velocity drops below 4.3 m/s are calculated to be approximately 470 feet. At this height, the single stack plume diameter is calculated to be 98 feet. The duct firing case has reduced plume velocity potential due to a lower exhaust temperature. The height at which the air-cooled condenser plume velocity drops below 4.3 m/s is calculated to be approximately 2,080

feet when duct firing and 1,530 feet when non-duct firing. At these heights the overall plume diameter would be over 850 feet and 700 feet respectively. As discussed in APPENDIX TT-1, merging of the air-cooled condenser exhaust with the two gas turbine exhausts could give the resultant merged plumes higher velocities than shown above. Therefore, potentially adverse impacts could occur to low-flying aircraft using the airspace above the GWF Tracy site. The plume velocities from GWF Tracy could cause moderate to severe turbulence. It should be noted that the plume velocity speed presented is average m/s of the entire plume diameter. Plume velocity speeds would be lower at the plume diameter edge and greater at the plume center point.

Per the applicant submitted FAA Form 7460, the FAA conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and Title 14 of the Code of Federal Regulations, part 77, concerning GWF Tracy (CH2M2009e). On November 7, 2008, the FAA issued the GWF Tracy applicant an FAA Determination of No Hazard to Navigable Airspace, concluding that the GWF Tracy project does not exceed obstruction standards and would not be a hazard to air navigation (CH2M2009e). Based on this evaluation, marking and lighting are not necessary for aviation safety (CH2M2009e). However, if marking and/or lighting are accomplished on a voluntary basis, the FAA recommended it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2 (CH2M2009e).

Parking

During construction, 12.3 acres of the overall 40-acre project site will be designated for construction laydown and parking (GWF 2008a, p. 5.12-7 and 2.1-1). No off-site construction worker parking is anticipated for the construction of GWF Tracy, as construction worker parking would be located on open land adjacent to the project site within the existing Tracy Power Station (GWF 2008a, p. 5.12-16).

Alternative Transportation

The RTD Tracer service map found that the nearest bus route and stop are located approximately 1.8 miles east of the GWF Tracy site (Route B, Stop 5) (RTD 2008). Therefore, no local bus stops are in immediate proximity of the GWF Tracy site. The nearest section of West Schulte Road that has on-street bicycle lanes extends from Central to Corral Hollow Road, approximately 1.2 miles east of the GWF Tracy site (GWF 2008a, p. 5.12-8). Furthermore, no existing or planned bicycle path facilities are located in the vicinity of the GWF Tracy project site and no local pedestrian facilities are in immediate proximity of the project site. No impacts would occur to alternative transportation facilities or use during construction and operation of the GWF Tracy project.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. *Cumulatively considerable* means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Title 14, California Code Regulation, section 15130).

Based on all current information available at this time, the following information outlines the status of major cumulative project development within 1.5 miles of the GWF Tracy site area.

- Ellis Specific Plan - Residential project consisting of approximately 2,500 units. The project is located within the City of Tracy sphere of influence, but outside the City limits. Construction is not expected to occur prior to 2013.
- Tracy Hills Project – Approximate 6,175-acre development consisting of residential, commercial, office, and industrial uses. Construction timeline is unknown at this time but may not occur prior to 2014.
- Cordes Ranch Specific Plan – Approximate 1,730-acres consisting of 400 acres of office and 1,230 acres of industrial uses. Timeline for construction is unknown.
- Gateway Project – Approximately 538-acre business park development. Construction timeline is unknown at this time but construction was planned to begin in 2008 and occur in phases over three to five years.

Continued development of the city of Tracy and San Joaquin County areas has contributed to congestion on area roadways that would be used by GWF Tracy related traffic. The approved or pending projects identified above would also result in an increase of traffic to GWF Tracy area, primarily in the form of construction-related traffic. In the event construction of the proposed project and the other listed projects were to occur simultaneously, cumulative impacts resulting in temporary lane closures and disruption of traffic flows could occur. Traffic associated with future residential and commercial developments within the area would further contribute to congestion on these affected roadways. Therefore, temporary roadway congestion resulting from GWF Tracy could combine with other construction projects within the area, and congestion resulting from future development could create a temporary cumulative significant impact. Construction-related traffic and activities associated with GWF Tracy could have the potential to combine with these projects and result in cumulative impacts to emergency vehicle access; parking; disruption of public transportation, pedestrian, bicycle, or rail travel; and physical damage to local transportation facilities.

However, GWF Tracy Conditions of Certification **TRANS-1** through **TRANS-4** are proposed to ensure that potentially significant impacts associated with short-term transportation and traffic impacts resulting from proposed project construction are reduced to less-than-significant levels. Therefore, GWF Tracy's cumulative contribution to this impact is considered reduced to a less-than-significant level. Furthermore, it is assumed that all cumulative projects identified above would include mitigation similar to that for GWF Tracy (i.e. the development of a construction traffic control plan) and would require approval from the city of Tracy, Caltrans, and all affected jurisdictions and agencies. This mitigation and approval would reduce not only project level transportation and traffic impacts of these projects, but reduce project-specific transportation and traffic impacts of cumulative projects as well. As agency approval of projects is gained, jurisdictional staggering of project construction and timing may occur to further reduce any potential cumulative transportation and traffic impacts. Therefore, GWF Tracy would not have a considerable cumulative contribution to transportation and traffic impacts within the area.

GWF Tracy construction workforce traffic, construction truck traffic, and operational truck traffic would not travel through areas with an identified high percentage of minority or low-income population. In addition, staff has determined that all significant direct or cumulative impacts specific to traffic and transportation resulting from the construction or operation of the project would either be less than significant or be reduced to a less-than-significant level. Therefore, the proposed project does not introduce traffic and transportation-related environmental justice issues.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Traffic and Transportation Table 11 provides a general description of applicable statutes, regulations, and standards adopted by the federal government, the State of California, San Joaquin County, and the city of Tracy pertaining to traffic and transportation with which the project is required to comply. Conditions of certification have been proposed to ensure project consistency with a law, ordinance, regulation, or standard where it was not already mandated by federal or state regulations.

Traffic and Transportation Table 11
Project Compliance with Adopted Traffic and Transportation Laws, Ordinances Regulations, and Standards

Applicable Law	LORS Description and Project Compliance Assessment
Federal	
Title 14, CFR, section 77 (14 CFR 77)	Includes standards for determining physical obstructions to navigable airspace. Sets forth requirements for notice to the Federal Aviation Administration of certain proposed construction or alterations. Also provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace (including temporary flight restrictions).
	On November 7, 2008, the FAA issued the GWF Tracy applicant an FAA Determination of No Hazard to Navigable Airspace, concluding that the GWF Tracy project does not exceed obstruction standards and would not be a hazard to air navigation (CH2M2009e). Based on this evaluation, the proposed project is consistent with FAA regulations pertaining to aviation safety and lighting.
CFR, Title 49, Subtitle B	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures) and specifies safety measures for motor carriers and motor vehicles that operate on public highways.
	Enforcement is conducted by state and local law enforcement agencies and through state agency licensing and ministerial permitting (e.g., California Department of Motor Vehicles licensing, Caltrans permits), and/or local agency permitting (e.g., San Joaquin County Department of Public Works permits). For a discussion of the potential impacts related to the transport of hazardous materials, please see the **HAZARDOUS MATERIALS MANAGEMENT** section in this PSA.

Applicable Law	LORS Description and Project Compliance Assessment
State	
California Vehicle Code, division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15	Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
	Enforcement is provided by state and local law enforcement agencies and through ministerial state agency licensing and permitting and/or local agency permitting. The use of oversize vehicles during construction can create a hazard to the public by limiting motorist views on roadways and by the obstruction of space by the oversize vehicle. Therefore, staff is proposing Condition of Certification **TRANS-4**, which would require that all oversize vehicles used on public roadways during construction comply with Caltrans limitations on vehicle sizes and weights.
California Streets and Highway Code, division 1 & 2, chapter 3 & chapter 5.5	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits.
	Enforcement is provided by state and local law enforcement and through ministerial state agency licensing and permitting and/or local agency permitting. There is also a potential for unexpected damage to roads by vehicles and equipment within the project area. Therefore, staff is proposing Condition of Certification **TRANS-3**, which would require that any road damaged by project construction be repaired to its original condition.
Local	
San Joaquin Council of Governments	Regional Congestion Management Program (CMP) sets forth 8 goals and 36 objectives to improve transportation in San Joaquin County.
	Project-related construction and operational traffic would not adversely impact any segment of CMP roadways analyzed for the proposed GWF Tracy project.
San Joaquin County Department of Planning	Specifies that "all county roadways shall operate at a Level of Service (LOS) C or better (except in a City sphere of influence where the City has adopted LOS D); intersections shall operate at an overall LOS D or better on minor arterials and roadways of higher classification; and LOS C on all other roads; all freeways and state highways shall operate at a LOS D or better."
	Construction traffic would impact the I-580 eastbound ramps/Corral Hollow Road intersection from and LOS C to an LOS E during the P.M. peak hour. Therefore, staff is proposing Condition of Certification **TRANS-1,** which would require the applicant to prepare a Traffic Control Plan prior to construction in order to reduce the impact of a decreased LOS at this intersection.
City of Tracy	Municipal Code Article 7 (Restricted Streets) Sections 3.08.290, 300, and 310 establishes truck routes within the City of Tracy, including designating particular roadways as truck routes and truck route restrictions.
	The use of oversize vehicles during construction can create a hazard to the public by limiting motorist views on roadways and by the obstruction of space by the oversize vehicle. Therefore, staff is proposing Condition of Certification **TRANS-4**, which would require that all oversize vehicles used on public roadways during construction comply with city of Tracy limitations on vehicle sizes, weights, and travel routes.

NOTEWORTHY PUBLIC BENEFITS

Neither the applicant nor staff has identified any traffic-related benefits associated with GWF Tracy.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No public or agency comments related to the Transportation and Traffic section were received.

CONCLUSIONS

Based on the list of significance thresholds identified above, staff has analyzed potential construction and operational impacts by the proposed GWF Tracy project related to the regional and local traffic and transportation system and conclude the following:

- The construction and operation of GWF Tracy as proposed with the effective implementation of staff's recommended Conditions of Certification **TRANS-1** through **TRANS-4,** would ensure that the project's direct adverse traffic and transportation impacts are less than significant and would ensure that the project complies with applicable LORS regarding traffic and transportation.
- Condition of Certification **TRANS-1** should be implemented to ensure that all construction-related traffic and construction-related activities would not impact transportation facilities and existing traffic levels within the project area, and to ensure the applicant or construction contractor develops a crossing safety plan for all phases of project construction to address foot traffic as well as construction-related vehicle crossing and the transport of heavy/oversize loads over the internal rail crossing.
- During operation, workforce and truck traffic to and from the facility would not result in a substantial increase in congestion, deterioration of the existing LOS, or creation of a traffic hazard during any time in the daily traffic cycle and would have a less-than-significant adverse impact along the routes or roadway intersections that would be used to access GWF Tracy site.
- On November 7, 2008, the FAA issued the GWF Tracy applicant an FAA Determination of No Hazard to Navigable Airspace, concluding that the GWF Tracy project does not exceed obstruction standards and would not be a hazard to air navigation (CH2M2009e). Based on this evaluation, marking and lighting are not necessary for aviation safety (CH2M2009e). However, if marking and/or lighting are accomplished on a voluntary basis, the FAA recommended it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2 (CH2M2009e). Therefore, the proposed project is consistent with FAA regulations pertaining to aviation safety and lighting.
- Condition of Certification **TRANS-2** should be implemented to ensure the applicant works with the FAA to notify all pilots using the Tracy Municipal Airport and updates all airspace charts that include GWF Tracy site to announce that invisible air plume hazards could exist and pilots should avoid direct overflight. **TRANS-2** would also

require the applicant to work with TCY to modify the Airport Facility Directory to show the location of the GWF site on a map or figure and put in a remark about thermal plumes could cause moderate to severe turbulence, and therefore, pilots should avoid direct overflight. In addition, **TRANS-2** would require the applicant to work with the FAA and/or TCY to add a caution to the TCY Automatic Weather Observation System (AWOS) recommending that pilots should avoid direct overflight of the airspace above GWF Tracy site.

- Condition of Certification **TRANS-3** should be implemented to ensure that any road damaged by project construction be repaired to its original condition.
- Condition of Certification **TRANS-4** should be implemented to ensure that all oversize vehicles used on public roadways during construction comply with Caltrans and city of Tracy limitations on vehicle sizes and weights, as well as oversize vehicle routes and any other applicable limitations or other relevant jurisdictional policies.
- No off-site construction worker parking is anticipated for the construction of GWF Tracy, as construction worker parking would be located on open land adjacent to the project site within the existing Tracy Power Station.
- No local bus stops are in immediate proximity of the GWF Tracy site. Furthermore, no existing or planned bicycle path facilities are located in the vicinity of the GWF Tracy project site and no local pedestrian facilities are in immediate proximity of the project site.

Should the Energy Commission certify the project, staff recommends that the Energy Commission adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall consult with the city of Tracy and prepare and submit to the Compliance Project Manager (CPM) for approval a construction traffic control plan and implementation program. The traffic control plan must be prepared in accordance with Caltrans Manual on Uniform Traffic Control Devices and the WATCH Manual and must include but not be limited to the following issues:

- Timing of heavy equipment and building materials deliveries
- Redirecting construction traffic with a flag person
- Signing, lighting, and traffic control device placement if required
- Need for construction work hours and arrival/departure times outside peak traffic periods
- Ensurance of access for emergency vehicles to the project site
- Temporary closure of travel lanes or disruptions to street segments and intersections during reconductoring activities or any other utility tie ins
- Access to residential and/or commercial property located near reconductoring routes or any other utility tie ins

- •Specification of construction-related haul routes, including the minimization of construction traffic using the I-580 eastbound ramps/Corral Hollow Road, I-580 southbound ramps/Patterson Pass Road, and the I-205 eastbound ramps/ Mountain House Parkway intersections during the P.M. peak hour and avoiding residential neighborhoods to the maximum extent feasible
- Identification of safety procedures for exiting and entering the site access gate
- Crossing safety for all phases of project construction to address foot traffic as well as construction-related vehicle crossing and the transport of heavy/oversize loads over the adjacent rail crossing

Verification: At least 30 days prior to site mobilization, the applicant or contractor shall provide to the CPM a copy of the referenced documents.

TRANS-2 Prior to start-up and testing activities of the plant and all related facilities, the project owner shall work with the FAA to notify all pilots using the Tracy Municipal Airport and airspace above GWF Tracy of potential air hazards. These activities would include, but not be limited to, the applicant's working with the FAA in issuing a notice to airmen (NOTAM) of the identified air hazard and updating the Terminal Area Chart and all other FAA-approved airspace charts used by pilots that include GWF Tracy site to indicate that pilots should avoid direct overflight. The applicant shall work with TCY to modify the Airport Facility Directory (AFD) to show the location of the GWF site on a map or figure and put in a remark about thermal plumes could cause moderate to severe turbulence, and therefore, pilots should avoid direct overflight. The applicant shall also work with the FAA and/or TCY to add a caution to the Automatic Weather Observation System (AWOS) recommending that pilots should avoid direct overflight of the airspace above GWF Tracy site.

Verification: At least 60 days prior to start of project operation, the project owner shall submit to the CPM for review copies of requests to the FAA and TCY requesting the incorporation of the project into the NOTAM, Terminal Area Chart, and Airport Facility Directory and any subsequent correspondence with these organizations.

TRANS-3 Following completion of project construction, the project owner shall repair any damage to roadways affected by construction activity along with the primary roadways identified in the traffic control plan for construction traffic to the road's pre-project construction condition. Prior to the start of construction, the project owner shall photograph, videotape, or digitally record images of the roadways that will be affected by pipeline construction and heavy construction traffic. The project owner shall provide the CPM and the city of Tracy with a copy of the images for the roadway segments under its jurisdiction. Also prior to start of construction, the project owner shall notify the city about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place and to coordinate construction-related activities associated with other projects.

Verification: Within 30 days after completion of the redevelopment project, the project owner shall meet with the CPM and the city of Tracy to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near-original condition as possible. Following completion of any regional road improvements, the project owner shall provide to the CPM a letter from the city of Tracy if work occurred within its jurisdictional public right-of-way stating its satisfaction with the road improvements.

TRANS-4 The project owner shall comply with Caltrans, San Joaquin County, city of Tracy and other relevant jurisdictions limitations on vehicle sizes, weights, and travel routes. In addition, the project owner shall obtain all necessary transportation permits from Caltrans, San Joaquin County, and the city of Tracy for roadway use.

Verification: In the Monthly Compliance Reports, the project owner shall submit copies of any permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

REFERENCES

AirNav 2008. Tracy Municipal Airport information website [online]: http://www.airnav.com/airport/TCY. Accessed November 6, 2008.

Aspen 2008. Communication between Aspen Environmental Group employee Scott Debauche and Tracy Municipal Airport Manager Bruce Ludeman. October 15, 2008.

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RTD 2008. San Joaquin Regional Transit District City of Tracy Tracer Bus Map and Schedule. November 6, 2008. Document viewed [online]: http://www.mvtransit.com/Tracer_schedule.htm

SJCOG 2007. San Joaquin Council of Governments Year 2007 Congestion Management Program Update, CHP Exhibit, CMP Network, Appendix B 2007 RCMP Road Network Map and list of State Highway and Local Arterial Road Segments, Page 59. September 2007. Document viewed [online]: http://www.sjcog.org/Programs%20&%20Projects/Regional_Planning_files/Congestion%20Management%20Plan.htm

APPENDIX TT-1
PLUME VELOCITY ANALYSIS

Testimony of William Walters, P.E.

INTRODUCTION

The following provides the assessment of the Tracy Power Plant (Tracy) gas turbines/heat recovery steam generator (HRSG) and air-cooled condenser exhaust stack plume velocities. Staff completed calculations to determine the worst-case vertical plume velocities at different heights above the stacks using the applicant's proposed gas turbine/HRSG and air-cooled condenser designs.

PROJECT DESCRIPTION

The proposed amended project would utilize two GE 7EA frame gas turbine/HRSGs with duct burners and one air cooled condenser for project cooling.

PLUME VELOCITY CALCULATION METHOD

Staff has selected a calculation approach form a technical paper (Best 2003) to estimate the worst-case plume vertical velocities for the Tracy exhausts. The calculation approach, which is also known as the "Spillane approach", used by staff is limited to calm wind conditions, which are the worst-case wind conditions. The Spillane approach uses the following equations to determine vertical velocity for single stacks during dead calm wind (i.e. wind speed = 0) conditions:

1. $(V*a)^3 = (V*a)_o^3 + 0.12*F_o*[(z-z_v)^2-(6.25D-z_v)^2]$
2. $(V*a)_o = V_{exit}*D/2*(T_a/T_s)^{0.5}$
3. $F_o = g*V_{exit}*D^2*(1-T_a/T_s)/4$
4. $Z_v = 6.25D*[1-(T_a/T_s)^{0.5}]$

Where: V = vertical velocity (m/s), plume-average velocity

a = plume top-hat radius (m, increases at a linear rate of $a = 0.16*(z- z_v)$

F_o= initial stack buoyancy flux m^4/s^3

z = height above ground (m)

z_v= virtual source height (m)

V_{exit}= initial stack velocity (m/s)

D = stack diameter (m)

T_a= ambient temperature (K)

T_s= stack temperature (K)

g = acceleration of gravity (9.8 m/s^2)

Equation (1) is solved for V at any given height above ground that is above the momentum rise stage for single stacks (where z > 6.25D) and at the end of the plume merged stage for multiple plumes. This solution provides the plume-average velocity for the area of the plume at a given height above ground; the peak plume velocity at the plume centerline, based on a standard Gaussian profile (bell curve), would be about two times higher than the plume-average velocity. As can be seen the stack buoyancy flux is a prominent part of Equation (1). The calm condition calculation basis clearly represents the worst-case conditions, and the vertical velocity would decrease substantially as wind speed increases.

For multiple stack plumes, where the stacks are equivalent, the multiple stack plume velocity during calm winds was calculated by staff in a simplified fashion, presented in the Best Paper as follows:

$$V_m = V_{sp} * N^{0.25}$$

Where: V_m = multiple stack combined plume vertical velocity (m/s)

V_{sp} = single plume vertical velocity (m/s), calculated using Equation (1)

N = number of stacks

Staff notes that this simplified multiple stack plume velocity calculation method predicts somewhat lower velocity values than the full Spillane approach methodology as given in data results presented in the Best paper (Best 2003). However, the Best paper does not present the multiple stack calculations in a manner that has allowed staff to determine the exact methodology and duplicate the results shown in the paper. Staff is also assuming less than complete conservation of energy, due to the geometry of multiple stacks, which would be represented by $N^{0.33}$ for ideal energy conservation and plume convergence.

VERTICAL PLUME VELOCITY ANALYSIS

The vertical plume velocities were calculated for reasonable worst case conditions for the gas turbines and cooling tower. The ambient and exhaust conditions for the gas turbines and cooling tower, operating at full load, are provided below in **Plume Velocity Table 1**.

Plume Velocity Table 1
Gas Turbine/HRSG and Air Cooler Parameters

Case	Gas Turbines/HRSG Non-Duct Firing	Air-Cooled Condenser Duct Firing	Air-Cooled Condenser Non-Duct Firing
	59°F [a]	**59°F [a]**	**59°F [a]**
Stack Height ft (m)	150 (45.72)	114 (34.75)	114 (34.75)
Stack Diameter ft (m)	17 (5.18)	49.8 (15.19) [b]	49.8 (15.19) [b]
Stack Velocity ft/s (m/s)	51 (15.55)	21.8 (6.64)	21.8 (6.64)
Exhaust Temperature F (K)	213 (373.7)	83 (301.5)	84 (302.0)

Source: GWF 2008a for gas turbines and for the air-cooled condenser dimensions, CH2M 2009a for the ACC operating conditions and exhaust temperature.
[a] Other ambient temperature cases with duct firing or non-duct firing would have somewhat different plume velocity potentials.
[b] Each for an assumed 21 of 25 fans operating on the air-cooled condenser at the 59°F ambient condition when duct firing and 13 of 25 fans operating when non-duct firing.

The gas turbine/HRSG stacks have a separation that is approximately 45 meters. Modeling determined that the gas turbines plumes would not begin merging before the velocity has slowed to less than 4.3 m/s; therefore, the gas turbine/HRSG exhausts are not modeled as two merged exhausts.

The air-cooled condenser was modeled assuming 21 of the 25 fans (five by five configuration) were operating when duct firing and 13 of the 25 fans were operating when non-duct firing. The stack diameter of each fan was based on the overall footprint of the air-cooled condenser. These adjacent plumes are assumed to fully merge, but a single equivalent stack modeling approach was not used. The use of a single equivalent stack approach for the air-cooled condenser would have increased and likely overestimated the calculated plume velocities. The gas turbine and air-cooled condenser plumes were not also merged.

Using the Spillane approach, the plume velocity at different heights above ground was determined. Staff's calculated plume average velocity values are provided in **Plume Velocity Table 2.**

Plume Velocity Table 2
Gas Turbine/HRSGs and Air-Cooled Condenser Predicted Plume Velocities

	Gas Turbines Non-Duct Firing Plume Velocity (m/s)	Air-Cooled Condenser Duct Firing Plume Velocity (m/s)	Air-Cooled Condenser Non-Duct Firing Plume Velocity (m/s)
Height (ft)	**59°F**	**59°F**	**59°F**
300	6.18	--[a]	--[a]
400	4.78	7.12	6.29
500	4.15	6.93	6.19
600	3.77	6.60	5.91
700	3.51	6.28	5.63
800	3.30	6.01	5.39
900	3.14	5.77	5.18
1,000	3.01	5.56	4.99
1,100	2.90	5.38	4.83
1,200	2.80	5.21	4.68
1,300	2.71	5.07	4.55
1,400	2.64	4.94	4.44
1,500	2.57	4.82	4.33
1,600	2.51	4.71	4.23
1,700	2.45	4.61	4.14
1,800	2.40	4.52	4.06
1,900	2.35	4.44	3.99
2,000	2.31	4.36	3.92

Source: Staff calculations.
[a] Within the jet phase of the plume and outside the bounds of the calculation.

As explained in the Transportation and Traffic section a vertical velocity of 4.3 m/s (plume average velocity) has been determined as the critical velocity of concern to light aircraft. For the gas turbine/HRSGs the height at which the combined plume velocity drops below 4.3 m/s are calculated to be approximately 470 feet. At this height the single stack plume diameter is calculated to be 98 feet (30 meters). The duct firing case has reduced plume velocity potential due to a lower exhaust temperature. It should be noted that the existing simple cycle design would have a higher plume velocity potential, even with a lower stack, due to both higher initial exhaust velocity and significantly higher exhaust temperature.

The height at which the air-cooled condenser plume velocity drops below 4.3 m/s is calculated to be approximately 2,080 feet when duct firing and 1,530 feet when non-duct firing. At these heights the overall plume diameter would be over 850 feet and 700 feet respectively.

Merging of the air-cooled condenser exhaust with the two gas turbine exhausts could give the resultant merged plumes higher velocities than shown above. The velocities shown above are plume average velocities. The peak plume centerline velocity, by Gaussian distribution principle, is two times the plume average velocity.

WIND SPEED STATISTICS

The Tracy Patterson Pass Road Ambient Air Quality and Meteorological Station is located within approximately two and a half miles of the project site. Staff has previously collected three years of meteorological data from this monitoring site, which indicates that an average hourly wind speed of zero occurred approximately 4% of the time, which is not a very high frequency, but an average wind speed of less than or equal to 2 m/s occurred more than 25% of the time and hours with such low average wind speeds are likely to have shorter periods of calm winds, periods long enough for the modeled maximum vertical plume velocities to occur. Therefore, calm conditions/low wind speeds are expected to occur reasonably frequently at the site.

CONCLUSIONS

The calculated calm wind condition vertical plume-average velocity from the Tracy air-cooled condenser is predicted to be greater than 4.3 m/s at 500 feet above ground, which is the threshold generally used by staff to trigger additional air traffic safety analysis, and the worst-case calm wind plume velocities would drop below 4.3 m/s at approximately 2,080 feet above ground for the air-cooled condenser when duct firing and 1,530 feet above ground when non-duct firing. The velocities from the gas turbines/HRSGs are below 4.3 m/s at 500 feet above ground and are of lesser concern. The worst-case ambient conditions used in the velocity calculations would occur, potentially frequently, during the plant's life when small aircraft could fly above the Tracy air-cooled condenser exhaust. Therefore, the air traffic pattern should be evaluated and appropriate mitigation measures recommended for this potential air safety impact.

REFERENCES

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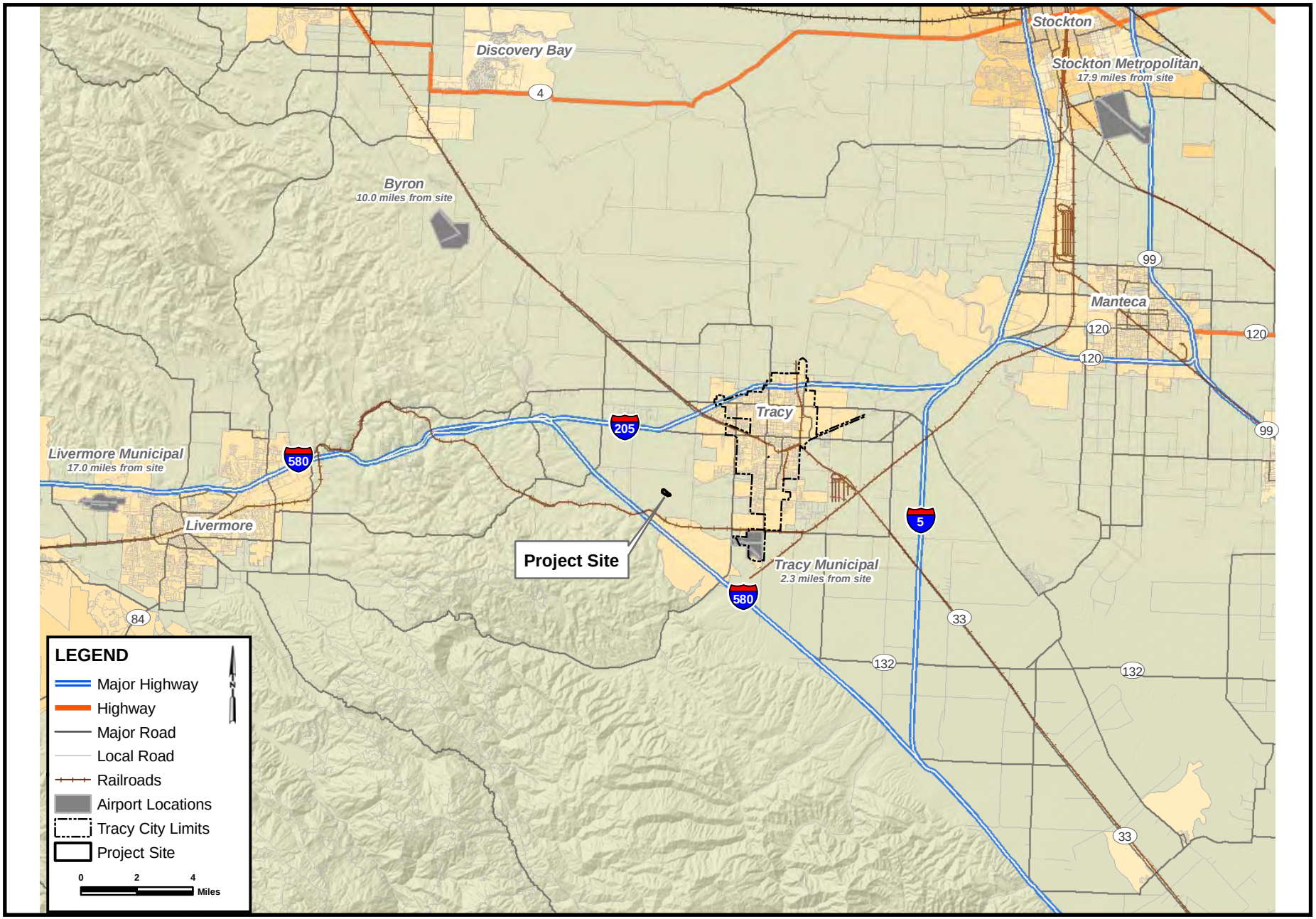
CH2M 2009a - CH2MHILL /J. Salamy (tn: 49662). E-mail with estimated air-cooled condenser mass flow and operating data from Jerry Salamy, CH2MHill, to William Walters, Aspen Environmental Group, dated December 1, 2008. Submitted to CEC/Docket Unit on 01/08/2009.

TRAFFIC AND TRANSPORTATION - FIGURE 1

GWF Tracy Combined Cycle Power Plant Project - Regional Transportation System



SOURCE: AFC Figure 5.12-1

TRAFFIC AND TRANSPORTATION - FIGURE 2

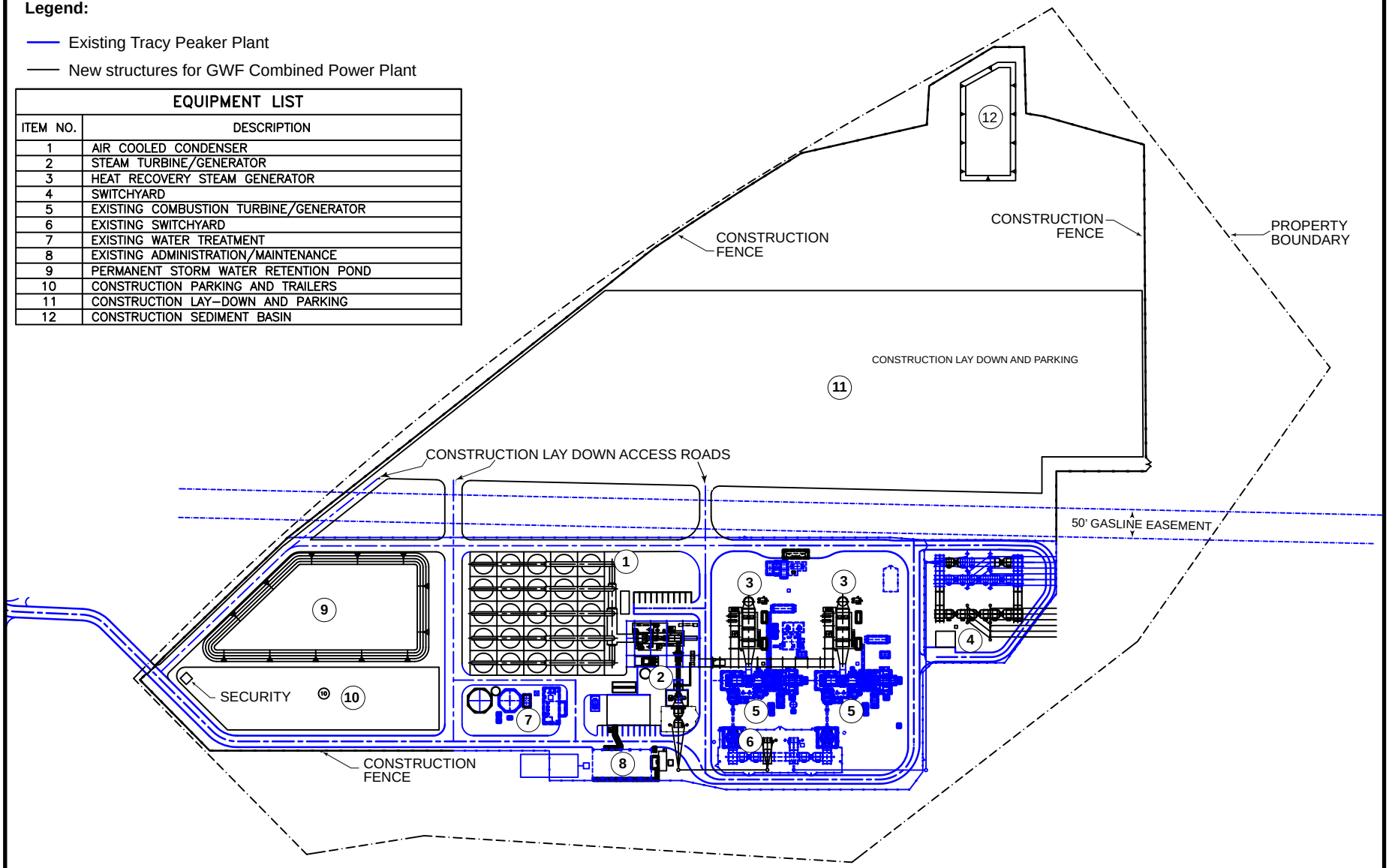
GWF Tracy Combined Cycle Power Plant Project - General Arrangement

Legend:

Existing Tracy Peaker Plant

New structures for GWF Combined Power Plant

EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
1	AIR COOLED CONDENSER
2	STEAM TURBINE/GENERATOR
3	HEAT RECOVERY STEAM GENERATOR
4	SWITCHYARD
5	EXISTING COMBUSTION TURBINE/GENERATOR
6	EXISTING SWITCHYARD
7	EXISTING WATER TREATMENT
8	EXISTING ADMINISTRATION/MAINTENANCE
9	PERMANENT STORM WATER RETENTION POND
10	CONSTRUCTION PARKING AND TRAILERS
11	CONSTRUCTION LAY-DOWN AND PARKING
12	CONSTRUCTION SEDIMENT BASIN



SOURCE: AFC Figure 1.1-4

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

SUMMARY OF CONCLUSIONS

The applicant, GWF Energy, LLC (GWF) proposes to transmit the power from the proposed GWF Tracy Combined Cycle Power Plant (GWF Tracy) to the regional Pacific Gas and Electric (PG&E) 115-Kilovolt (kV) transmission grid through the overhead 115-kV line utilized by the existing Tracy Peaker Plant (TPP). Three segments of this existing TPP line would be upgraded and a new on-site 115-kV line constructed to handle the extra energy from GWF Tracy, which would be an upgrade of TPP. The proposed new line, segment upgrades, and the existing TPP line would constitute the GWF Tracy line. The line and related switchyards would be designed, built, and maintained according to PG&E guidelines for line safety and field management that conform to applicable laws, ordinances, regulations and standards (LORS). GWF Tracy would occupy a 16.38-acre fenced site within the existing GWF-owned owned 40-acre parcel, meaning that there would be no nearby residents to be exposed to the generated electric and magnetic fields. With adoption of staff's five proposed conditions of certification, any safety and nuisance impacts from use of the proposed GWF Tracy line would be less than significant.

INTRODUCTION

The purpose of this analysis is to assess the line design and operational plan for the transmission lines proposed for transmitting the power from the proposed project upgrade (of the existing Tracy Peaker Plant into the GWF Tracy combined cycle project) to determine whether their related field and non-field impacts would constitute a significant environmental hazard in the area around the proposed routes. All related health and safety LORS are currently aimed at minimizing such hazards. Staff's analysis focuses on the following issues taking into account both the physical presence of the line and the physical interactions of its electric and magnetic fields:

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

The following federal, state, and local laws and policies apply to the control of the field and non-field impacts of electric power lines. Staff's analysis examines the project's compliance with these requirements.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Transmission Line Safety and Nuisance (TLSN) Table 1
Laws, Ordinances, Regulations and Standards (LORS)

Applicable LORS	Description
Aviation Safety	
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR),"Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1G, " Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/460-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
Interference with Radio Frequency Communication	
Federal	
Title 47, CFR, Section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
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 interference.
Audible Noise	
Local	
San Joaquin County General Plan, Noise Element	References the County's Ordinance Code for noise limits.
Hazardous and Nuisance Shocks	
State	
CPUC GO-95, "Rules for Overhead Electric Line Construction"	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.

Applicable LORS	Description
Title 8, California Code of Regulations (CCR) Section 2700 et seq. “High Voltage Safety Orders”	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.
National Electrical Safety Code	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
Industry Standards	
Institute of Electrical and Electronics Engineers (IEEE) 1119, “IEEE Guide for Fence Safety Clearances in Electric-Supply Stations”	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
Electric and Magnetic Fields	
State	
GO-131-D, CPUC ”Rules for Planning and Construction of Electric Generation Line and Substation Facilities in California”	Specifies application and noticing requirements for new line construction including EMF reduction.
CPUC Decision 93-11-013	Specifies CPUC requirements for reducing power frequency electric and magnetic fields.
Industry Standards	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
Fire Hazards	
State	
14 CCR Sections 1250-1258, “Fire Prevention Standards for Electric Utilities”	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

SETTING

As noted in the **PROJECT DESCRIPTION** section, the site for the proposed GWF Tracy project is a 16.38-acre plot within the existing GWF-owned, 40-acre parcel in unincorporated San Joaquin County immediately southwest of Tracy, California, and approximately 20 miles southwest of Stockton, California. The power from the existing TPP is transmitted to PG&E’s regional power grid through an overhead 115-kV line connecting the facility to the PG&E Schulte Switching Station located at the site. From this switching station, the power is further transmitted to PG&E’s Tesla, Kasson, and Manteca Substations. The Tesla Substation is the major distribution point for electrical power in this PG&E service area and is connected to more than a dozen 500-kV, 230-

kV, and 115-kV grid lines in this regard. The route of the TPP-related transmission line to be used traverses a sparsely populated area with no nearby residences. Accommodating the power from the proposed TPP upgrade would necessitate building and operating a new on-site 115-kV switchyard, and an on-site overhead transmission line connecting GWF Tracy's generator to the existing on-site 115-kV switchyard. Such accommodation would also necessitate expanding the existing PG&E Schulte Switching Station to allow a looping in of the existing 115-kV Tesla-Manteca transmission line.

In addition to the new on-site GWF Tracy connection line, two other segments of the existing TPP connection with the Tesla Substation would be upgraded at specific points downstream from the first point of connection at the site. The specific locations of these two segments (of 1.6 miles and 0.7 miles respectively) are at specific sections on the existing line in the area around the intersection of Interstate Highways 5 (I-5) and 205 (I-205) and also near the Kasson Substation (GWF 2008a, pp. 1-2, 1-3, 2-15 and 3-1). The applicant has provided information identifying these locations and their respective distances from the TPP site. Any GWF Tracy-related field and non-field impacts of potential concern would mostly occur at the points of connection and upgrade along the existing TPP line.

PROJECT DESCRIPTION

The proposed GWF Tracy project lines would consist of the following:

- A new, on-site 115-kV, overhead transmission line connecting GWF Tracy's generator to the existing on-site TPP Switchyard;
- The project's on-site 115-kV switchyard to which the new 115-kV line would be connected;
- Segment upgrades of 0.7 miles, and of 1.6 miles at locations downstream from the initial on-site connection point; and
- Project-related expansion of the existing PG&E Schulte Switchyard to allow a looping in of the existing Tesla-Manteca transmission line.

The upgrade of the noted three segments of the existing TPP line would require only replacing the existing conductors with the larger-capacity conductors that would accommodate the added power; the existing support structures would continue to be used. Two 45-foot tall 5.5-foot diameter tubular steel support structures would be utilized for looping the existing Tesla-Manteca transmission line into the GWF Tracy site (GWF 2008a, pp. 2-2 and 2-15). The existing, proposed replacement, and new conductors would be standard low-corona aluminum, steel-reinforced cables utilized by PG&E and the major utilities for lines in this voltage class and current-carrying capacity. The applied design and construction methods would remain in keeping with PG&E guidelines that ensure line safety and efficiency together with reliability, and maintainability (GWF 2008a, pp 2-2, 2-15, and 3-7 through 3-10).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

The potential magnitude of the line impacts of concern in this staff analysis depends on compliance with the listed design-related LORS and industry standards. These LORS have been established to maintain impacts below levels of potential significance. Thus, if staff determines that the proposed GWF Tracy line project would comply with applicable LORS, we would conclude that any transmission line-related safety and nuisance impacts would be less than significant. The nature of these individual impacts is discussed below together with the potential for compliance with the LORS that apply.

DIRECT IMPACTS AND MITIGATION

Aviation Safety

Any potential hazard to area aircraft would relate to the potential for collision in the navigable airspace.

As noted by the applicant (GWF 2008a, p. 3-8), there are no major commercial aviation centers in the general vicinity of GWF Tracy. The nearest airport is the Stockton Airport over 20 miles to the northwest. A smaller local airport, the Tracy Municipal airport, is within two miles of the GWF Tracy. In spite of its closeness, the proposed line would not pose an aviation hazard to utilizing aircraft because its runway is orientated away from the line. This means that an FAA notice of construction would not be required for the relatively short segments to be built or upgraded. There are local crop-dusting operations in the project area; however, the Tesla-Manteca loop of potential concern regarding aircraft operations would be located within existing transmission corridors and not pose a potential threat to crop-dusting operations (GWF 2008a, p. 3-8).

Interference with Radio-Frequency Communication

Transmission line-related radio-frequency interference is one of the indirect effects of line operation and is produced by the physical interactions of line electric fields. 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 level of any such interference usually depends on the magnitude of the electric fields involved and the distance from the line. The potential for such impacts is therefore minimized by reducing the line electric fields and locating the line away from inhabited areas.

The new on-site line and segment upgrades would be built and maintained in keeping with standard PG&E practices that minimize surface irregularities and discontinuities.

Moreover, the potential for such corona-related interference is usually of concern for lines of 345-kV and above, and not for 115-kV lines to be utilized. The low-corona designs for the proposed upgrades and new on-site line are used for all PG&E and major utility lines of similar voltage rating to reduce surface-field strengths and the related potential for corona effects. Since these existing lines do not currently cause corona-related complaints along their existing routes, and there are no residences in the vicinity of the proposed segment upgrades, staff does not expect any residential corona-related radio-frequency interference or related complaints in the general project area. However, staff recommends Condition of Certification **TLSN-2** to ensure mitigation as required by the FCC in the unlikely event of complaints.

Audible Noise

The noise-reducing designs related to electric field intensity are not specifically mandated by federal or state regulations in terms of specific noise limits. As with radio noise, such noise is limited instead through design, construction or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability, and reliability. 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 lines of less than 345-kV as proposed for GWF Tracy. 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 right-of-way of 100 feet or more. Since the low-corona designs are also aimed at minimizing field strengths, staff does not expect the proposed line operation to add significantly to current background noise levels in the project area. For an assessment of the noise from the proposed line and related facilities, please refer to staff's analysis in the **NOISE AND VIBRATION** section.

Fire Hazards

The fire hazards addressed through the related LORS in **TLSN Table 1** 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.

Standard fire prevention and suppression measures for similar PG&E lines would be implemented for the proposed on-site project lines and line upgrades. The applicant's intention to ensure compliance with the clearance-related aspects of GO-95 would be an important part of this mitigation approach. Condition of Certification **TLSN-4** is recommended to ensure compliance with important aspects of the fire prevention measures (GWF 2008a, pp. 3-12 and 3-14).

Hazardous Shocks

Hazardous shocks 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.

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 specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public.

The applicant's stated intention to implement the GO-95-related measures against direct contact with the energized line (GWF 2008a, pp. 3-12 and 3-14) would serve to minimize the risk of hazardous shocks. Staff's recommended Condition of Certification **TLSN-1** would be adequate to ensure implementation of the necessary mitigation measures.

Nuisance Shocks

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's electric and magnetic fields.

There are no design-specific federal or state 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). For the proposed project line, the project owner will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. This would be accomplished through standard industry grounding practices (GWF 2008a, p. 3-14). Staff recommends Condition of Certification **TLSN-5** to ensure such grounding for the proposed on-site lines and segment upgrades.

Electric and Magnetic Field Exposure

The possibility of deleterious health effects from EMF exposure has increased public concern in recent years about living near high-voltage lines. Both electric and magnetic fields occur together whenever electricity flows and exposure to them together is generally referred to as EMF exposure. The CPUC, other regulatory agencies, and staff have evaluated the available evidence and concluded that such fields do not pose a significant health hazard to exposed humans. There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. Most regulatory agencies believe, as staff does, 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.

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 feasible reduction of such fields 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.
- There are measures that can be employed for field reduction, but they 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 many high-voltage lines owned and operated by investor-owned utilities) 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 requires 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. Publicly owned utilities, 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 factors 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 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 most new lines in California are currently required by the CPUC to be designed according to the EMF-reducing guidelines of the electric utility in the service area involved, the proposed line's fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the chosen line according to existing PG&E field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management.

The CPUC has recently revisited the EMF management issue to assess the need for policy changes to reflect the available information on possible health impacts. The CPUC found that there is no need for significant changes to existing field management policies. Since there are no residences in the immediate vicinity of the proposed project line, there would not be the long-term residential EMF exposures mostly responsible for the health concern of recent years. The only project-related EMF exposures of potential significance are the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in the vicinity of the line. These types of exposures are short term and well understood as not significantly related to the health concern. Given the potential for human exposures, staff recommends measurements of each line's maximum fields to allow for uniform, field strength-related characterization of all lines. It is such field strength measurements that are required in Condition of Certification **TLSN-3**

Industry's Approach to Reducing Field Exposures

The present focus is on the magnetic field because unlike electric fields, it can penetrate the soil, buildings and other materials to produce the types of human exposures at the root of the health concern of recent years. The industry seeks to reduce exposure, not by setting specific exposure limits, but through design guidelines that minimize exposure in each given case. As one focuses on the strong magnetic fields from the more visible high-voltage power lines, staff considers it important, for perspective, to note that an individual in a home could be exposed too much stronger fields while using some common household appliances than from high-voltage lines (National Institute of Environmental Health Services and the U.S. Department of Energy, 1998). 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.

As with similar PG&E lines, specific field strength-reducing measures would be incorporated into the design of the proposed line to ensure the field strength minimization currently required by the CPUC in light of the concern over EMF exposure and health.

The field reduction measures to be applied include the following:

1. Increasing the distance between the conductors and the ground to an optimal level;

2. Reducing the spacing between the conductors to an optimal level;

3. Minimizing the current in the line; and

4. Arranging current flow to maximize the cancellation effects from interacting of conductor fields.

The applicant has estimated the maximum field strengths within the route of the proposed new lines or upgraded line segments at the centerline and a benchmark distance of 200 feet on either side. For the electric field, this maximum intensity was estimated at 0.7 kV/m, and 115 mG for the companion magnetic field. Staff has verified the accuracy of the applicant's calculation methods but recommends the measurement requirements in **TLSN-3** to validate the applicant's assumed reduction efficiency. The calculated field intensities are similar to those of PG&E lines of similar voltage and current-carrying capacity.

CUMULATIVE IMPACTS AND MITIGATION

When field intensities are measured or estimated for a specific location, they reflect the interactive, and therefore, cumulative effects of fields from all contributing conductors. This interaction could be additive, or subtractive depending on prevailing conditions. As noted by the applicant (GWF 2008a, pp. 1-2, 1-3, 2-2 and 3-1), the conductors for the new lines or upgraded segments would be located within GWF or PG&E property boundaries or within existing line corridors meaning that the calculated intensities would reflect the interactive and thus cumulative impacts of fields from contributing lines. Since the proposed on-site lines and system upgrades would be designed or modified according to applicable field-reducing PG&E guidelines (as currently required by the CPUC for effective field management), any contribution to total area exposures should be at levels expected for PG&E lines of similar voltage and current-carrying capacity. It is this similarity in intensity that constitutes compliance with current CPUC requirements on EMF management. 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 Condition of Certification **TLSN-3**.

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 lines to be interconnected. The utility in this case is PG&E. Since the proposed new line or modified line segments and related switchyards would be designed according to the respective requirements of the LORS listed in Table 1, and operated and maintained according to current PG&E guidelines on line safety and field strength management, staff considers the presented design and operational plans to be in compliance with the health and safety requirements of concern in this analysis and recommends approval.. The actual contribution of the new or modified lines chosen line to the area's field exposure levels would be assessed from results of the field strength measurements required in Condition of Certification **TLSN-3**.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff received no public or agency comments on the transmission line nuisance and safety aspects of the proposed GWF Tracy project.

CONCLUSIONS

Since neither the proposed new line nor upgrades of the existing line would pose an aviation hazard according to current FAA criteria, staff does not consider it necessary to recommend location changes on the basis of a potential hazard to area aviation.

The potential for nuisance shocks from the proposed project lines would be minimized through grounding and other field-reducing measures to be implemented in keeping with current PG&E guidelines (reflecting standard industry practices). These field-reducing measures would maintain the generated fields within levels not associated with radio-frequency interference or audible noise. The potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of PUC's General Order 95. Compliance with Title 14, California Code of Regulations, Section 1250, would minimize fire hazards while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the proposed route.

Since electric or magnetic field health effects have neither been established nor ruled out for fields from the proposed GWF Tracy project and similar transmission lines, the public health significance of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed line designs and operational plans would be adequate to ensure that the electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information. The long-term, mostly residential magnetic exposure of health concern in recent years would be insignificant for the proposed line given the general absence of residences along their proposed routes. On-site worker or public exposure would be short term and at levels expected for PG&E lines of similar design and current-carrying capacity. Such exposure is well understood and has not been established as posing a significant human health hazard.

Since the proposed project line would be operated to minimize the health, safety, and nuisance impacts of concern to staff and would be located along a route without nearby residences, staff considers the proposed design, maintenance, and construction plans as complying with the applicable laws. With the conditions of certification proposed below, any such impacts would be less than significant.

PROPOSED CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed new lines and upgrade the identified line segments according to the requirements of California Public Utility Commission's GO-95, GO-52, GO-131-D, Title 8, and Group 2. High Voltage Electrical Safety Orders, Sections 2700 through 2974 of the California Code of Regulations, and PG&E's EMF-reduction guidelines.

Verification: At least thirty days before starting construction of the proposed new lines and system upgrades, the project owner shall submit to the Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines and related structures will be constructed according to the requirements stated in the condition.

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

Verification: At least thirty days before starting operation of either line option, the project owner shall submit to the CPM a letter signed by a California registered electrical engineer affirming the project owner's intention to comply with this requirement.

TLSN-3 The project owner shall use a qualified individual to measure the strengths of the electric and magnetic fields from the constructed line and system upgrades at the points of maximum intensity for which intensity estimates were provided by the applicant. The measurements shall be made before and after energization according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures. These measurements shall be completed not later than six months after the start of operations.

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

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

Verification: At least thirty days before the start of operations, the project owner shall transmit to the CPM a letter affirming the project owner's intention to comply with this condition.

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

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter affirming the intention to comply with this condition.

REFERENCES

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

GWF 2008a. Application for Certification (08-AFC-7) for GWF Tracy Combined Cycle Power Plant, Volumes I and II submitted to the California Energy Commission on June 25, 2007.

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

VISUAL RESOURCES

Testimony of Marie McLean

SUMMARY OF CONCLUSIONS

Staff has analyzed the visual resource-related information pertaining to the proposed GWF Tracy Combined-Cycle Power Plant Project (GWF Tracy), a 314 MW combined-cycle plant to be located near Tracy, California. Staff notes that GWF Tracy proposes to convert the 159 MW, simple-cycle Tracy Peaker Plant (TPP), approved by the California Energy Commission on July 17, 2002, to a combined-cycle plant to be known as GWF Tracy.

As constructed, GWF Tracy's generation capacity will be 145 MW. Combined with the 169 MW generating capacity of the TPP, GWF Tracy will have a combined total generation capacity of 314 MW.

Staff found that the proposed GWF Tracy, with staff-recommended conditions of certification:

1. Would not introduce an adverse aesthetic impact as described in the Guidelines for Implementation of the California Environmental Quality Act.

2. Would comply with applicable laws, ordinances, regulations, and standards (LORS) pertaining to aesthetics or preservation and protection of sensitive visual resources.

INTRODUCTION

Visual resources consist of the viewable natural and man-made features of the environment. In this section staff evaluates the impacts on visual resources resulting from constructing and operating GWF Tracy.

The proposed visual impacts are evaluated according to the California Environmental Quality Act (CEQA) Guidelines, "Aesthetics," and applicable local laws, ordinances, regulations, and standards (LORS) pertaining to aesthetics or preservation and protection of sensitive resources.

The California Energy Commission staff uses a standard visual assessment methodology to assess aesthetic impacts of projects. That methodology was used to analyze this project. A copy of the methodology is included in **Appendix VR-1**.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Visual Resources Table 1 provides a general description of identified adopted federal, state, and local LORS pertaining to aesthetics or preservation and protection of sensitive visual resources relevant to GWF Tracy.

Visual Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
Federal	
Transportation Equity Act for the 21st Century of 1998, and Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2005.	Designed to protect federally managed lands or a recognized National Scenic Byway or All-American Road within its vicinity. Does not apply to this project.
State	
California Streets and Highways Code, Sections 260 through 263 – Scenic Highways	Designed to ensure the protection of highway corridors that reflect the State's natural scenic beauty.
Local	
San Joaquin County General Plan 2010, Chapter IV, Public Facilities; Agricultural Land; Objectives	Designed to minimize the impact on agriculture in the transition of agricultural land to development
San Joaquin County General Plan 2010, July 1992; Volume 1, Section VI, Resources	Designed to ensure the preservation of open space, including lands for scenic value, views of waterways, hilltops, oak groves; scenic vistas; scenic roads; development along scenic roads; and landscaping plans for development along scenic routes.
San Joaquin County General Plan 2010, July 1992; Community Development Chapter	Designed to provide guidelines for coherent organization of community development pattern; economic development; housing; circulation; utilities; and public facilities
San Joaquin County General Plan 2010, July 1992; Resources; Open Space, Policy 13	Development proposals along scenic routes shall not detract from the visual and recreational experience.
San Joaquin County General Plan 2010; July 1992; Public Facilities; Recreation, Policy 23	Scenic corridors along recreational travel ways and scenic routes shall be protected from unsightly development.

SETTING

GWF Tracy will be sited on approximately 16 of the 40-acre site owned by GWF Tracy LLC (GWF). This 16-acre parcel, which also includes the TPP, is located in an unincorporated portion of San Joaquin County immediately southwest of Tracy and approximately 20 miles southwest of Stockton. The conversion of the TPP to GWF Tracy added approximately four acres to the plant’s footprint.

GWF Tracy will be located on a site zoned General Agriculture in the *San Joaquin County General Plan 2010*. This General Agriculture designation allows for power generating facilities to be located on land designated General Agriculture. At one time Tracy and the surrounding area were known for its rural character—agricultural land and rolling, steep hills. However, the area is rapidly changing; and commercial, residential, and industrial development is becoming more prominent.

According to the city of Tracy, the city is becoming a popular location for industrial business (City of Tracy Industrial Development; www.ci.tracy.ca.us/departments/economic_development/industrial/. However, a residential slow-growth measure, passed in 2000, has limited the number of homes to be built in Tracy to 600 per year, retroactive to January 1, 2000.[1]

The property on which GWF Tracy is to be located is bounded by the Central Valley Project's Delta-Mendota Canal and the State Water Project's California Aqueduct to the southwest; agricultural land to the south and east; and a branch of the Union Pacific Railroad Company to the north. The Owens-Brockway glass container manufacturing plant, the Nutting-Rice warehouse, and the Tracy Biomass Generation Facility are located immediately north GWF Tracy. Other industrial facilities, including the Safeway/Costco Distribution Facilities, are located about one and one-quarter miles northwest of the plant.

Interstate 580 (I-580), both a county and state scenic route, runs southwest of and roughly parallel to the California Aqueduct, about one and one-half miles directly west of the project site. An inactive railway runs along the north edge of the site. See **Visual Resources Figure 1** for a location map of GWF Tracy.

ASSESSMENT OF IMPACTS

This section includes information about the following:

1. Method and threshold for determining significance
2. Direct/indirect impacts and mitigation
3. Cumulative impacts and mitigation

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Visual resources consist of the landscape's various elements that contribute to the visual character of a place. Those elements, either natural or human-made, include objects, vistas, and viewsheds. A visual assessment begins with an inventory of the

[1] In 2000 the citizens of Tracy passed Measure A, a slow-growth initiative designed to limit to an average of 600 per year, retroactive to January 1, 2000, the number of building permits issued by the city. When the voters approved Measure A, the city had already issued about 6,000 permits for new housing. Consequently, Tracy estimates it will not issue any new building permits, excluding permits for infill development and affordable housing until 2012. The city may issue 100 permits for infill and up to 150 permits for affordable housing. When the city does begin to issue building permits, the permits will be rationed among developers. See "Cumulative Impacts" and "Response to Agency and Public Comments" at the end of this document for additional information about Measure A.

visual resources of a particular site. The assessment process involves (1) establishing the project's visual environment, primarily through Key Observation Points (KOPS); (2) assessing the visual resources of those KOPs; and (3) identifying viewers' responses to those KOPs.[2]

To determine a project's potentially significant impact on visual resources, Energy Commission staff reviews the project according to "Guidelines for the Implementation of the *California Environmental Quality Act*; Appendix G, "Environmental Checklist Form, Aesthetics." As required by the guidelines, staff determines a project's potentially significant impact on visual resources by evaluating whether the project would substantially:

A. Adversely affect a scenic vista.

B. Damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

C. Degrade the existing visual character or quality of the site and its surroundings.

D. Create a new source of light or glare that would adversely affect day or nighttime views in the area.

In preparing its assessment, staff reviewed federal, state, and local laws, ordinances, regulations, and standards (LORS) and used KOPs to evaluate the proposed project's visual impact on the existing environmental setting. Three KOPs, selected to represent the most critical locations from which the project would be seen, were used to assess the visual impacts of this project.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Information about direct and indirect impacts and proposed mitigation is included in this section and grouped according to the questions found in the CEQA Environmental Checklist Form.

[2] Key Observation Points (KOPS) are commonly used in visual analysis. In addition to the Energy Commission, other federal, state, and local agencies use KOPs when analyzing the effects of projects on visual resources. Those agencies include the U.S. Department of Interior's Bureau of Land Management; U.S. Forest Service; and U.S. Department of Transportation; California Department of Parks and Recreation; and many California city and county planning departments.

Visual Resources Table 2
CEQA Environmental Checklist Form—Aesthetics

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
AESTHETICS —Would the project:				
A. Have a substantial adverse effect on a scenic vista?				X
B. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, historic buildings within a state scenic highway, or part of a river, stream, or estuary ?			X	
C. Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
D. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?		X		

A. Scenic Vista

"Would the project have a substantial adverse effect on a scenic vista?"

For the purpose of this analysis, a *scenic vista* is defined as a distant view through and along a corridor or opening that exhibits a high degree of pictorial quality. No scenic vistas exist in the KOP1, KOP2, and KOP3 viewsheds.

B. Scenic Resources

"Would the project substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway corridor?"

For the purpose of this analysis, a scenic resource includes a unique water feature such as a waterfall; transitional water such as river mouth ecosystems, lagoons, coastal lakes, and brackish wetlands; or part of a stream or river, or estuary. In addition, a scenic resource could also be a unique physical geological terrain such as rock masses, outcroppings, layers, or spires; a tree with a unique visual or historical importance such as a tree linked to a famous event or person or an ancient old-growth tree; historic building; or a designated federal scenic byway or highway or a state scenic highway corridor.

One scenic highway, I-580, is applicable to this project. Interstate 580 has been identified by California Department of Transportation (CalTrans) as an officially designated State Scenic Highway and by San Joaquin County as a Scenic Route (*San Joaquin County General Plan 2010*, 1992). Interstate 580 is located approximately one-and-one-half miles from the project site.

At one time the area around the power plant was known for its scenic, rural character. Today, however, large industrial facilities are located in the area, including the already-existing TPP as well as several warehouses, trucking and distribution facilities, and a manufacturing plant.

As a result, the area around the plant has and will continue to have a decidedly industrial character. Considering the industrial setting within which the proposed project will be added and the one-and one-half mile distance to I-580, staff determined that the project would not substantially damage scenic resources within a state scenic highway corridor.

C. Visual Character or Quality

"Would the project substantially degrade the existing visual character or quality of the site and its surroundings?"

To determine whether the project would substantially degrade the existing visual character or quality of the site and its surroundings, staff organized its analysis according to linear facilities; construction impacts and mitigation; and operational impacts and mitigation.

Linear Facilities

Linear facilities will consist of pipelines for gas and water as well as the following electrical elements. For electrical elements, the project will require the addition of a switchyard and transmission lines, including:

1. Onsite 115-kilovolt (kV) switchyard to provide an additional circuit breaker and transformer for the STG power output.

2. A 115 kV overhead transmission line from the steam turbine generator step-up transformer to the existing 115-kV switchyard.

3. Placement of two 45-foot tall, 5.5-foot diameter, tubular steel transmission structures necessary to loop PG&E's Tesla-Kasson 115-kV line through the southeastern corner of the site. The existing Tesla-Kasson 115-kV line is adjacent to the project site.

4. Reconduction of the 2.5 mile section of the Vierra-Tracy-Kasson 115 kV line and the possible reconduction of the 8.9 mile section of the Schulte SW ST-Kasson-Manteca 115 kV line in lieu of staff's preferred mitigation of installing a special protection system.

Linear facilities will be constructed at the same time as the power plant and would appear to be part of it. Consequently, their impacts are evaluated with those of the power plants.

Construction Impacts and Mitigation

Construction activities for the project are scheduled to occur over a twelve-month period, beginning in fourth quarter 2011 with a commercial operation date set for second quarter 2013.

Construction impacts are organized according to (1) Construction Laydown and Parking; (2) Lighting; and (3) Linears.

Construction Laydown, Parking, and Linears

As previously indicated in this analysis, GWF Tracy will incorporate the existing TPP and occupy approximately 16 acres of the existing GWF-owned 40-acre site in San Joaquin County. Approximately 12 acres of the site will be used for construction laydown and parking. Those 12 acres are located outside the existing plant's fence line.

Construction of the proposed power plant and facilities would cause temporary disturbance of approximately 12.3 acres of the site due to the presence of equipment, materials, and excavated piles of dirt. In addition, the construction of linears for gas and water would result in a noticeable but temporary on-site visual disruption.

Staff-Proposed Mitigation

In the AFC, the applicant indicated the intention to adhere to and maintain requirements set forth in Condition of Certification **VIS-2**, proposed for the TPP in 2002. This condition of certification requires that visual impacts of construction be adequately mitigated, including screening and restoring surface conditions and any rights-of-way. Staff proposes continuing those requirements and has incorporated them into Condition of Certification **VIS-1** and Condition of Certification **VIS-2**. See **PROPOSED CONDITIONS OF CERTIFICATION** at the end of this document.

Lighting

Construction activities are scheduled to occur between 6:00 am and 6:00 pm, Monday through Saturday for 22 months. If needed, a second shift will be added during months 15 through 20 between 3:00 pm and 11:00 pm, Monday through Saturday. According to the applicant, during nighttime construction, the applicant proposes (1) to the extent possible shield and point lighting toward the center of the site where activities are occurring; and (2) use task-specific lighting to the extent practical while complying with worker safety regulations.

During periods when nighttime construction takes place, the applicant will use illumination that meets state and federal worker safety regulations (GWF Combined Cycle Power Plant Project AFC, 2008a).

Energy Commission staff has proposed Condition of Certification **VIS-3,** which is designed to minimize to the greatest extent possible the impacts of construction lighting on the surrounding areas. See **PROPOSED CONDITIONS OF CERTIFICATION** at the end of this document.

Operational Impacts

Operational impacts are analyzed by reviewing key observation points (KOPs). KOPs represent the most critical locations from which the project would be seen. The selection of three KOPs by the applicant was coordinated with the Energy Commission staff. See **Visual Resources Figure 2** for the location of those KOPs. See **APPENDIX VR-1** for information about the process used to evaluate each KOP.

KOP 1 (Visual Resources Figure 3), Southwest from South Lammers Road and West Schulte Road

This KOP is located at the intersection of West Schulte Road and South Lammers Road, approximately one mile northeast of the project site. West Schulte Road, a two-lane to four-lane undivided roadway, runs in an east-west alignment past the site. South Lammers Road, a two-lane roadway, runs in a north-south alignment approximately one mile west of the project site.

This KOP was selected to represent the views of residents of a housing development located approximately one-quarter mile from the junction of South Lammers Road and West Schulte Road as well as the residents of several houses located in a rectangular parcel of land located directly in front of the housing development and ending at the junction of South Lammers Road and West Schulte Road.

The view from KOP1 is dominated by agricultural land in the foreground; industrial facilities in the midground, including the Tracy Peaker Plant, Owens-Brockway glass container manufacturing plant, and the Nutting-Rice warehouse. Hills dominate the background. The Tracy Biomass Generation Facility is located immediately north of the glass manufacturing plant and warehouse. Various trucking facilities, including a Safeway and Costo distribution centers and warehouses are located approximately one-quarter mile northwest of the site.

Transmission towers and lines are perceptible in the midground; and wind turbines, in the background. The glass container manufacturing plant dominates the built environment in this KOP.

Visual Sensitivity

KOP1 represents a view of moderately low visual quality. This view, which already includes the Tracy Peaker Plant, will be seen primarily by residents who live in the vicinity of West Schulte Road and South Lammers Road, either in the housing development, the triangular strip of land bordering the housing development, or the scattered housing located along West Schulte Road.

At this location, a relatively small number of residences have a view of the project site. Residents of approximately 16 houses located in the housing development would see this view, although the view would be mitigated by the small number of houses located

in the adjacent rectangular parcel. Residents whose homes are located in the rectangular parcel would have a more direct view. Scattered residents of housing located along South Lammers Road would also have a view of the power plant. However, the orientation of those houses as well as landscaping of both the houses and the power plant would minimize their exposure.

Because the site is located approximately one mile from the housing included in this KOP and residents are familiar with the industrialized nature of the area, viewer concern is moderate. In addition, the visibility of the project is moderately low. The view is dominated by three large industrial buildings to the east of the plant. The number of residential viewers and duration of view is moderately low. Consequently, viewer exposure is moderately low and visual sensitivity for this KOP is moderately low.

Visual Change

Visual Resources Figure 4 is a photo simulation of the proposed project as viewed from KOP1. As depicted, the proposed project includes the additions that are proposed as part of GWF Tracy, including two new heat recovery steam generators (HRSG); two new 150-foot tall, 17-foot diameter exhaust stacks, which replaced the TPP's two 100-foot stacks; a 114-foot tall by 234-foot wide air-cooled condenser (ACC); and a new 400,000 gallon fire service water storage tank. Also included in the photo simulation is landscaping at approximately five years. This landscaping was required for TPP and is continued for approximately four acres to account for the addition of GWF Tracy.

Other publicly visible components of the project include a new water treatment building; the addition of an onsite 115-kilovolt (kV) switchyard and overhead transmission line from the step-up transformer to the 150 kV switchyard.

The contrast resulting from the introduction of the new elements on the site is low. The two exhaust stacks are each 50 feet higher than the previous stacks. However, the stacks blend in with other vertical elements in the landscape. The air-cooled condenser is clearly visible in the photograph. However, the view of the condenser is partially screened by the existing water tower as well as the homes' landscaping. Hence, the proposed plant does not dominate the view from this KOP and neither does it block or disrupt views. As a result, the rating for view blockage is low. And the visual change resulting from the addition of new elements on site is low.

Visual sensitivity from this KOP is moderately low; visual change is low. The industrial nature of this location, coupled with the seven-year-existing Tracy Peaker Plant, presents to residents an industrial view that began in the 1940s with the introduction of the Southern Pacific Railroad.[3] This industrial trend continued with the construction of the Owens-Brockway Glass Container manufacturing plant and other industrial facilities, including the Nutting Rice Warehouse; the Tracy Peaker Plant, constructed in 2002; and the Tracy Biomass Generation facility. The moderately low rating for visual sensitivity and the low rating for visual change result in an impact of not significant.

[3] Union Pacific acquired Southern Pacific Railroad's holdings in 1996.

Staff-Proposed Mitigation

The addition of GWF Tracy to the current TPP will result in the addition of approximately four acres to the site. The applicant has proposed adhering to and maintaining the existing landscaping for the TPP site and as well as planting the same species of trees and shrubs as required in the landscaping plan required for TPP Condition of Certification **VIS-1** as it appears in the January 2002 *Supplement to Staff Assessment*.

This landscaping plan consists of Fremont cottonwoods (Populus fremontii); western rebud (cercis occidentalis); and elderberry (sambucus Mexicana) trees along the northern, eastern, and western edges of the TPP site. The continuation of the previous landscaping plan will help to blend GWF Tracy with its surroundings and comply with local ordinances.

Staff has incorporated the requirements of that condition concerning the TPP into Condition of Certification **VIS-4**. See **PROPOSED CONDITIONS OF CERTIFICATION** at the end of this document.

KOP 2, Southeast from Interstate 580

KOP2 (**Visual Resources Figure 5**) represents a view of the project seen by motorists traveling in the westbound lane on Interstate (I) 580, which is located about one and one-half miles southeast of the site. I-580 runs in a north-south direction about one and one-half miles due west of the power plant. This heavily-traveled highway is a designated scenic highway by both San Joaquin County and the state of California for its panoramic agricultural views. According to the California Department of Transportation (CalTrans), the annual average daily traffic (AADT) for the closest milepost to the site is 37,000 cars. Consequently, the number of motorists who could view the site from I-580 is high.

Visual Sensitivity

The visual quality of KOP2 is moderately low. Agricultural land and associated structures dominate the foreground, including the California Aqueduct and the Delta-Mendota Canal. The terrain slopes downward towards the midground, the location of the project site, thus lowering the site from view. This view is dominated by industrial facilities and transmission lines. The city of Tracy is visible in the background.

The number of motorists who could see this KOP from traveling on I-580 is high. The view of the plant, largely unobstructed, is in the normal cone of vision for drivers and passengers. However, this portion of I-580 would likely be used by drivers who, traveling at least 60 miles per hour, focus their attention on long-range views of the road, not on the peripheral environment.

The Tracy Peaker Plant is located approximately one and one-half mile from this KOP. Visibility is low because drivers would be focusing attention on freeway driving, not on off-freeway views. Also, the one and one-half mile distance of the plant from I-580 contributes to the plant’s low visibility. The number of viewers is high; duration of view is low. Viewer exposure is moderate; and viewer sensitivity is moderately low.

Visual Change

Visual Resources Figure 6 is a photo simulation of the proposed project's publicly visible structures after completion of construction: two new heat recovery steam generators (HRSGs); two new 150-foot tall, 17-foot diameter exhaust stacks; a 114-foot tall by 234-foot wide air-cooled condenser (ACC); and a new 400,000 gallon fire service water storage tank. Also included in the photo simulation is landscaping at approximately five years. This landscaping was required for TPP and is continued for approximately four acres to account for the addition of GWF Tracy.

Other publicly visible components include a new water treatment building; addition of an onsite 115-kilovolt (kV) switchyard and overhand transmission line from the step-up transformer to the 150 kV switchyard.

The contrast resulting from the introduction of the new elements on the site is low. The new exhaust stacks are 50 feet higher than the previous stacks. However, their height is imperceptible when compared with the previous stacks. The introduction of the new air-cooled condenser recedes in the background and blends in with the other industrial buildings in the area.

The new additions do not dominate the view from this KOP. Instead, the view is dominated by the existing industrial structures located to the east and west of the plant. Also, the new additions do not block or disrupt views. Hence, the rating for view blockage is low. Consequently, the visual change resulting from the addition of the new units is low.

Visual sensitivity from this KOP is low; visual change is low. This area is dominated by industrial features and has been for several years. Consequently, viewers expect an industrial setting when in this area. The low rating for visual sensitivity and the low rating for visual change due to the additions to the plant result in an impact of not significant.

Staff-Proposed Mitigation

The addition of GWF Tracy to the current TPP will result in the addition of approximately four acres to the site. The applicant has proposed adhering to and maintaining the existing landscaping for the TPP site and as well as planting the same species of trees and shrubs as required in the landscaping plan required for TPP Condition of Certification **VIS-1** as it appears in the January 2002 *Supplement to Staff Assessment*.

This landscaping plan consists of Fremont cottonwoods (Populus fremontii); western rebud (cercis occidentalis); and elderberry (sambucus Mexicana) trees along the northern, eastern, and western edges of the TPP site. The continuation of the previous landscaping plan will help to blend GWF Tracy with its surroundings and comply with local ordinances.

Staff has incorporated the requirements of that condition concerning the TPP into Condition of Certification **VIS-4**. See **PROPOSED CONDITIONS OF CERTIFICATION** at the end of this document.

KOP 3, Southwest from Hansen Road

This view, **Visual Resources Figure 7**, is the view from Hansen Road, which is located about one mile southwest of the site. This KOP was selected to represent the view of residents living in a cluster of homes along Hansen Road. Situated near I-580, and located approximately one-quarter mile south of the California Aqueduct and one-half mile south of the Delta-Mendota Canal, these houses are oriented away from the project. However, the project can still be viewed from the houses, depending on residents' activities.

From this view, the agricultural land and related structures are visible in the foreground; transmission towers and lines as well as industrial buildings in the midground; and hills in the background. In the KOP's midground the Tracy Peaker Plant is located in the center and the Nutting-Rice Warehouse and Owens-Brockway glass plant, to the north.

Visual Sensitivity

Visual quality from this KOP is moderately low for residential viewers. Residential viewers generally are considered to be highly sensitive to changes in their viewshed. However, the distance from the residences to the site—approximately one mile—combined with orientation of the houses away from the site and the long-time industrial nature of the area results in a moderate level of viewer concern.

The visibility of the project is moderately low due to the distance from the project and the orientation of the houses away from the project. Because of the relatively small number of houses at this KOP, the number of residential viewers is moderately low. However, because of the unobstructed view of the power plant from this location, duration of view is moderately high. Consequently, viewer exposure is moderate; and visual sensitivity, moderate.

Visual Change

Visual Resources Figure 8 is a photo simulation of the project's publicly visible structures after completion of construction, including two new heat recovery steam generators (HRSGs); two new 150-foot tall, 17-foot diameter exhaust stacks; a 114-foot tall by 234-foot wide air-cooled condenser (ACC); and a new 400,000-gallon fire service water storage tank. Also included in the photo simulation is landscaping at approximately five years. This landscaping was required for TPP and is continued for approximately four acres to account for the addition of GWF Tracy.

The contrast of the new exhaust stacks and the water storage tanks with the existing site is moderately low in terms of form, line, and color. The exhaust stacks and tanks repeat the lines created by the transmission towers to the north of the plant. However, the addition of the air-cooled condenser dominates the landscape and partially blocks the background view of the city of Tracy.

The dominance of the air-cooled condenser combined with the view blockage resulting from the 50-foot exhaust stacks result in a moderately high rating for view blockage. From this KOP, visual sensitivity resulting from the new units is moderate; visual change

is moderate. The moderate rating for visual sensitivity and the moderate rating for visual change due to the addition of the new units result in an impact of adverse but less than significant.

Staff-Proposed Mitigation

The addition of GWF Tracy to the current TPP will result in the addition of approximately four acres to the site. The applicant has proposed adhering to and maintaining the existing landscaping for the TPP site and as well as planting the same species of trees and shrubs as required in the landscaping plan required for TPP Condition of Certification **VIS-1** as it appears in the January 2002 *Supplement to Staff Assessment*.

This landscaping plan consists of Fremont cottonwoods (Populus fremontii); western rebud (cercis occidentalis); and elderberry (sambucus Mexicana) trees along the northern, eastern, and western edges of the TPP site. The continuation of the previous landscaping plan will help to blend GWF Tracy with its surroundings and comply with local ordinances.

Staff has incorporated the requirements of that condition concerning the TPP into Condition of Certification **VIS-4**. See **PROPOSED CONDITIONS OF CERTIFICATION** at the end of this document.

Linears

Linears for the project include pipelines for gas and water as well as a new onsite 115-kV, 735-foot overhead electric transmission tie-line from the steam turbine generator step-up transformer necessary to connect GWF Tracy to the PG&E Schulte Switching Station and the Tesla-Manteca 115 kV transmission line running adjacent to the site.

The visual impact of the gas and water pipelines as well as this tie-line from each KOP would be low. All construction for the pipelines will occur within the project site and be shielded from public view. The visual impact of the transmission line modification would also be low because of the size of the tie-in line; use of nonreflective materials; distance from each KOP; and the prevalence of transmission lines in the area.

In addition, the construction period for the entire transmission line modification will be approximately three to four months and the activity at any one site will last only several days. Therefore, visual impacts of construction activities as well as residual impacts at the pull sites and towers would be temporary, lasting less than one year, and would be insignificant. Those visual impacts are not considered further in this analysis.

Visible Water Vapor Plumes

Visible water vapor plumes from the proposed GWF Tracy gas turbine/HRSG exhausts are expected to occur infrequently, well below 20% of seasonal daylight clear hours. Therefore, the visual impact analysis of the expected plume sizes would not be significant.

No visible water vapor plumes will be emitted from the air cooled condenser; and visible plumes are not expected to be emitted from the small auxiliary boiler. See **APPENDIX VR-2** at the end of this analysis.

D. Light and Glare

"Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?"

The proposed project during construction and operation has the potential to introduce light off-site to surrounding properties and up-lighting to the nighttime sky. If bright exterior lights were not hooded and lights not directed on site, they could introduce significant light or glare in the vicinity.

Lighting for project construction would occur between 6 a.m. and 6 p.m. for up to 22 months. And, if needed, construction would be extended during months 15 through 20, between the hours of 3 pm and 11 pm, Monday through Saturday. During periods when nighttime construction takes place, the applicant will use illumination that meets state and federal worker safety regulations (GWF Combined Cycle Power Plant Project AFC, 2008a).

To ensure the project would not be a source of glare, the applicant has proposed adhering to TPP conditions of certification VIS-3, VIS-4, and VIS-5. Those conditions pertain to the (1) design and direction of lighting; and (2) color and texture of finishes used on project structures, transmission facilities, fences, and walls.

Staff-Proposed Mitigation

Staff proposes to continue those three conditions of certification pertaining to the TPP project in the following three conditions of certification:

1. **VIS-5**, designed to minimize off-site and up-lighting

2. **VIS-6**, designed to ensure light does not reflect from buildings, structures, or walls

3. **VIS-7**, designed to ensure that fencing is installed around the site's perimeter and does not reflect light

See **PROPOSED CONDITIONS OF CERTIFICATION** at the end of this document.

Cumulative Impacts

As defined in Section 15355 of the *CEQA Guidelines* (California *Code of Regulations*, Title 14), a cumulative impact is defined as a change in the environment that results from adding the effect of the project to those effects of closely-related past, present and probable future projects. That is, while any one project may not create a significant impact to visual resources, the combination of the new project and all existing or planned projects in the area may create significant impacts. A significant cumulative visual impact would depend on the degree to which (1) the view shed is altered; (2) views of a scenic resource are impaired; or (3) visual quality is diminished.

Staff notes that the TPP has been operating at this location for seven years on land zoned for general agriculture and that the *San Joaquin General Plan 2010* allows for the construction and operation of power facilities as a compatible use. In addition, the project exists in an area that, although zoned for agricultural use, has been used for industrial purposes for many years. For example, the Southern Pacific Railroad began

operating in the area in the 1940s. Today the area is home to warehouses; trucking distribution and meatpacking facilities; and a manufacturing plant.

The introduction to the KOP1, KOP2, and KOP3 viewsheds of the two new heat recovery steam generators (HRSG); two new 150-foot tall, 17-foot diameter exhaust stacks; a 114-foot tall by 234-foot wide air-cooled condenser (ACC); a new 400,000 gallon fire service water storage tank; and a 125,000-gallon demineralized water tank; and an upgrade of an existing firewater tank to 300,000 gallons would not result in a cumulatively considerable change to the existing visual setting.

However, when analyzed in connection with two proposed housing projects in the area, the introduction of GWF Tracy to the site could have the potential to create significant cumulative visual impact. The impact would result from the distance those projects are to be located from the GWF Tracy site.

In addition, the addition of GWF Tracy to the TPP site has the potential to create a new source of light and glare. Staff analyses of the proposed housing projects and light and glare resulting from the introduction of GWF Tracy to the site follow.

Proposed Housing Projects

Ellis and Tracy Hills, two proposed mixed-use development projects, have been approved by the City of Tracy to be built in the vicinity of the GWF Tracy site. That site currently includes the Tracy Peaker Project (TPP), which began operation in 2002.

As envisioned, Ellis will be a 321-acre village of mixed residential housing types and densities plus a community park, family swim center, and 180,000 acres of commercial development. Tracy Hills, a projected 6,127-acre project will consist of 5,499 residential units and 1,923 acres of commercial development.

The construction and operation of GWF Tracy on the existing TPP site will not have a significant cumulative visual impact on these two mixed-use developments for the following reasons:

1. At its closest point, the proposed site of Ellis is located less than one mile east of GWF Tracy. However, according to the City of Tracy's *Ellis Specific Plan,* published in December 2008, special landscape features on Lammers Road will be required. Lammers Road, which runs north-south, is located less than a mile from the plant and forms the western boundary for the housing development. That landscaping feature will provide a buffer on Lammers Road, which will screen the plant. In addition, the housing areas, organized around a village center concept, will be heavily landscaped and oriented away from the plant.

2. Tracy Hills, at its closest point, is located approximately one mile southeast of GWF Tracy. If built as proposed in the most recent *Tracy Hills Specific Plan*, approved by the City of Tracy on June 16, 1998, light industrial and office buildings would be built next to the California Aqueduct and the Delta-Mendota Canal and interspersed between office buildings and high-density and medium-density residential. The location of the office and light industrial buildings abuts the property owned by GWF Tracy and is a compatible use with GWF Tracy.

In addition, the *Tracy Hills Specific Plan* includes mitigation to shield residential viewers from the commercial and industrial acreage, including location, design, and orientation of residences as well as a landscaping buffer and greenbelt. That mitigation would likely shield residents from a view of GWF Tracy. In addition, a wildlife habitat proposed for the Kit Fox will provide a buffer between the residences and GWF Tracy.

Staff notes, however, that on November 7, 2000, Tracy residents adopted Measure A, a modification to the city's slow-growth policy. Measure A limits new homes built in Tracy to 600 per year. When voters approved Measure A, the city already had issued about 6,000 permits for new housing. As a result, the city of Tracy estimated it would not issue any new building permits—excluding 100 permits for infill development and 150 permits for affordable housing—between 2006 and 2012. Measure A allows the city to issue up to 100 permits for infill housing and up to 150 permits for affordable housing during that time.

When housing permits are issued in 2012, the city will be limited to issuing 225 building permits each year for housing developments. All developers who wish to build housing developments in Tracy must compete for those permits. The legality of this 225 limit of building permits for housing developments was confirmed in the 2007 San Joaquin County Court decision, *Tracy Regional Alliance for A Quality Community (TRAQC)* v. *City of Tracy, City Council of City of Tracy* (Case CV029502). Consequently, at this time the date of completion of the Ellis or Tracy Hills development in its current configuration is questionable.[4]

Light and Glare

The addition of GWF Tracy to the existing TPP site has the potential to introduce additional light and glare to the project site, resulting in a significant cumulative visual impact. Consequently, staff has proposed conditions of certification **VIS-3**, **VIS-5**, **VIS-6, and VIS-7** to help ensure that visual impacts of light and glare are minimized. With proper implementation of those conditions, visible nighttime lighting and glare would be kept to less than significant levels.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

California *Government Code*, Section 65300, requires each city and county in California to adopt a general plan for the physical development of the county or city and any land outside its boundaries that bears relation to its planning. On the basis of these general plans, cities and counties establish policies and strategies necessary to carry out elements of the plan.

[4] On April 11, 2007, the San Joaquin Superior Court, in *Tracy Regional Alliance for a Quality Community (TRAQC)* v. *City of Tracy, City Council of Tracy*, agreed with TRAQC's argument that the Tracy Hills Agreement and Ellis Development Agreement executed by the City of Tracy exceeded the November 7, 2000, Measure A ordinance passed by the voters in which the residential growth allotments to development projects were limited at 225 per year.

San Joaquin County adopted a general plan, *San Joaquin County General Plan 2010*, in 1992, which includes polices and strategies pertaining to visual resources. Visual Resources Table 3, which follows, includes a description of these policies and strategies—laws, ordinances, regulations, and standards—as they pertain to GWF Tracy as well as staff's proposed conditions of certification to help ensure GWF Tracy's conformance with them.

Visual Resources Table 3
GWF Tracy Consistency With Visual Resources LORS

LORS		Determination of Consistency	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
San Joaquin County General Plan 2010, Chapter IV, Public Facilities; Agricultural Land; Objectives	To minimize the impact on agriculture in the transition of agricultural land to urban development.	YES AS CONDITIONED	GWF Tracy is to be constructed in on land zoned General Agriculture. San Joaquin County General Plan 2010 identifies power generation facilities as compatible uses in within agricultural areas. However, to help minimize the transition from agricultural land to urban development, applicant has suggested and staff has recommended conditions of certification VIS-1; VIS-2; VIS-4; VIS-6; and VIS-7.
San Joaquin Country General Plan 2010, Section VI, Resources	Designed to ensure preservation of open space, including lands for scenic value and scenic roads; development along scenic roads; and landscaping for development along scenic roads.	YES	
San Joaquin County General Plan 2010, Community Development Chapter	Designed to provide guidelines for coherent organization of community development patterns; economic development; housing; circulation; utilities; and public facilities	YES	

LORS		Determination of Consistency	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
San Joaquin County General Plan 2010, Resources; Open Space, Policy 13	Development proposals along scenic routes shall not detract from the visual and recreational experience	YES AS CONDITIONED	I-580 is a designated scenic highway by both San Joaquin County and the state of California. The project has the potential to detract from the visual experience and create a new source of light and glare. See conditions of certification VIS-1, VIS-2, VIS-3, VIS-4, VIS-5, VIS-6, and VIS-7.
San Joaquin County General Plan 2010; Public Facilities; Recreation, Policy 23	Scenic corridors along recreational travel ways and scenic routes shall be protected from unsightly development.	YES AS CONDITIONED	I-580 is a designated scenic highway by both San Joaquin County and the state of California. The project has the potential to detract from the visual experience and create a new source of light and glare. See conditions of certification VIS-1, VIS-2, VIS-3, VIS-4, VIS-5, VIS-6, and VIS-7.
Title 9, Development Title of San Joaquin County, Division 10, Development Regulations	Includes standards for parking, landscaping, fencing and screening, light and glare, and noise for commercial structures.	YES AS CONDITIONED	I-580 is a designated scenic highway by both San Joaquin County and the state of California. The project has the potential to detract from the visual experience and create a new source of light and glare. See conditions of certification VIS-1, VIS-2, VIS-3, VIS-4, VIS-5, VIS-6, and VIS-7.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments from agencies were received. Comments from the public were received as follows:

1. Property owners Charles Tuso, Steve Tuso, and Annette Elissagaray. Represented by Seligman & Willette, Inc., Stockton, California. Letter dated October 14, 2008.

2. Property owner Annette Elissagaray. Comments made at Preliminary Staff Assessment Workshop, Tracy City Hall, June 23, 2009.

3. Tracy Hills, LLC and developer Angelo Tsakopoulis represented by Hefner, Stark, & Marois, Sacramento, California. Letter dated July 3, 2009.

A summary of comments addressed in each document follows as well as staff's response.

TUSO AND ELISSAGARAY COMMENTS

The October 14, 2008, letter from Siligman & Willette, Inc., representing Charles Tuso, Steve Tuso, and Annette Elissagaray, contains eleven objections to or concerns about the GWF Tracy project. Objection 2, which follows, pertains to visual resources:

> The proposed facilities increase the height of the improvements from 110 feet, as previously approved, to 140 feet. This increase further exacerbates the adverse visual impacts on the quality of life and the right to the quiet enjoyment to which my clients are entitled in the use and occupancy of their property, and further undermines their ability to cause different uses to their property.

Staff's Response

Staff has reviewed the August 2001 *Application for Certification, Tracy Peaker Project*, as submitted by GWF Energy LLC as well as the July 2008 *Application for Certification, GWF Tracy Combined Cycle Power Plant Project*, and notes the following:

1. The structures that most closely resemble the height of those included in the category of "improvements," as included in Item 2 of the October 14, 2008, letter are two exhaust stacks 100 feet x 16 feet.

2. In the July 2008 *Application for Certification*, the height of the two exhaust stacks are increased to 150 feet x 17 feet.

When performing an analysis of the visual impacts of a project according to the California Environmental Quality Act (CEQA) Checklist Form—Aesthetics, staff bases its analysis on a consistently applied methodology. This methodology is explained in the document, "Energy Commission Visual Resource Analysis Evaluation Criteria," which is included at the end of this visual analysis as Appendix VR-1, *Energy Commission Visual Resource Analysis Evaluation Criteria*.[5]

The Energy Commission's criteria with which to assess visual impacts are based on Key Observation Points (KOPs). A KOP is selected to be representative of the most critical viewsheds from off-site locations where the project would be visible to the public—for example; recreational and residential areas, travel routes, bodies of water, as well as scenic and historic resources. See Appendix **VR-1,** *Energy Commission Visual Resource Analysis Evaluation Criteria*, at the end of this document.

In conducting its visual analysis for the GWF Tracy Combined-Cycle Power Plant, staff noted that the:

1. GWF Tracy Peaker Plant already existed on the site in question and the GWF Tracy Combined-Cycle Power Plant is an upgrade of this peaker plant.

2. GWF Tracy Peaker as well as the GWF Combined-Cycle Power Plant are sited on land designated as General Agriculture in the *San Joaquin County General Plan 2010*. However, in the general plan, the General Agriculture designation includes

[5] In its response, staff has considered the 150 feet x 17 feet exhaust stacks to be those referenced by Mr. Seligman as causing an adverse visual impact.

power generating facilities as a compatible use within areas designated as General Agriculture. Consequently, the siting of a power plant at this location is permitted.

3. The site is surrounded by other industrial developments including the Owens-Brockway Glass Container manufacturing plant; Nutting-Rice warehouse; Tracy Biomass Generation Facility; a meatpacking facility; and various trucking distribution centers, including those operated by Costco and Safeway.

4. The Tuso properties located on South Lammers Road were taken into account in KOP1. See the visual analysis for KOP 1 in this document and **Visual Resources Figure 9**. In the visual analysis, staff concluded that the impact was not significant and therefore, did not need to be mitigated.

5. The Tuso and Elissagaray properties on Valpico Road were not considered for inclusion in a KOP because of their location approximately four to five miles from the plant site. A view of the plant from such a distance would be greatly diminished. See **Visual Resources Figure 9**.

ANNETTE TUSO ELISSAGARAY COMMENTS

At the June 23, 2009, Preliminary Staff Assessment Workshop held at Tracy City Hall, property owner Annette Tuso Elissagaray commented on the project. A written copy of her comments was posted to the Energy Commission's website on July 15, 2009. Mrs. Elissagaray's objections pertain to the plant's impacts on her quality of life, including her loss of a view from every point on her land and homes. In this section, staff responds to Ms. Elissagaray's concerns pertaining to her loss of a view.

Staff's Response

Staff notes that Mrs. Elissagaray's comments as they pertain to visual resources are those expressed by Mr. Seligman in his October 14, 2008, letter, written on behalf of the Tusos and Mrs. Elissagaray. Staff has addressed those concerns in items I though 5, above.

TRACY HILLS DEVELOPMENT COMMENTS

On July 3, 2009, the law firm Hefner, Mark, and Marois, Sacramento, California, sent a letter to the Energy Commission on behalf of its client, Tracy Hills, LLC, owned by Sacramento-based AKT Development, and the developer of Tracy Hills, a mixture of residential, commercial, and industrial land uses.

In that letter the firm commented on AKT Development's objections to the visual resources section of the Preliminary Staff Assessment (PSA), published June 9, 2009. Specifically, the firm's objections center around what it considers the failure of the visual resources section to include information about the "cumulatively considerable visual impacts from the plant on Tracy Hills" and offers to the Commission suggestions for feasible mitigation, including requiring the applicant to plant landscaping along the Delta-Mendota Canal. Staff's response to the July 3, 2009, letter follows.

Staff's Response

CEQA requires that a visual analysis be based on the condition of the physical environment at the time the Application for Certification (AFC) is submitted. Consequently, Energy Commission staff selects Key Observation Points (KOPs) from which to assess visual impacts of projects. Had Tracy Hills, a projected 6,127-acre project consisting of 5,499 residential units and 1,923 acres of commercial development, existed as a project when the application was filed in July 2008 and KOPs were selected, Tracy Hills would likely have been selected as a KOP.

However, Tracy Hills did not exist when the AFC was filed; nor does it exist as a physical project today. Consequently, an analysis of the direct impacts of GWF Tracy on Tracy Hills is not required.[6]

However, staff notes that the City of Tracy will require landscaping of Tracy Hills to ensure it is compatible with surrounding uses, which will include GWF Tracy. Staff also notes that the city's *Tracy Hills Specific Plan* includes mitigation to shield residential viewers from the commercial and industrial acreage surrounding the area. That mitigation includes location, design, and orientation of residences as well as a landscaping buffer and greenbelt. In addition, a wildlife habitat proposed for the Kit Fox will provide a buffer between the residences and GWF Tracy

In addition, if Tracy Hills were to be constructed in its current configuration, at its closest point, it would be more than one mile from GWF Tracy. Energy Commission staff notes that projects located more than one mile from viewers do not result in visually significant impacts that must be mitigated.[7]

CONCLUSIONS

Activities related to the construction and operation of GWF Tracy would be visible from three KOPs, South Lammers Road and West Schulte Road; Westbound I-580; and Hansen Road. However, all three KOPs are located at least one mile from the project site. Consequently, construction activities as well as the visibility of the plant itself would be muted. In addition, to further diminish the visual effects from construction and operation, staff has proposed conditions of certification **VIS-1** through **VIS-7** to minimize the effects of construction-related and operation-related activities and help to ensure that GWF Tracy will blend into the site and surrounding landscape.

[6] Staff notes that CEQA requires an assessment of the change in the environment resulting from adding the effect of GWF Tracy to those effects of closely-related past, present, and probable future projects. Consequently, staff has analyzed the visual impacts on two housing development projects proposed for the City of Tracy, Ellis and Tracy Hills. That assessment may be found in the "Cumulative Impacts" section of this document.

[7] Because of the passage of Measure A in 2000 as well as various other legal requirements, including the updating of the city of Tracy's General Plan and its revision of the *Specific Plan for Tracy Hills,* it is unlikely Tracy Hills will be built in its current configuration. See also Footnote 1 and Footnote 4.

Staff believes that with the implementation of staff-recommended conditions, GWF Tracy's construction and operation activities would generate a less than significant visual impact for the following reasons:

1. GWF Tracy has the potential to detract from the visual experience by creating a new source of light and glare. Consequently, staff has recommended conditions of certification **VIS-3**, **VIS-5, VIS-6; and VIS-7** to reduce the impact to less than significant.

2. GWF Tracy will be located in on land zoned General Agriculture. The *San Joaquin County General Plan 2010* allows for power generating facilities to be located on land designated General Agriculture. Although the site of GWF Tracy already includes an existing power plant and the area has a decidedly industrial feel about it, the applicant has recommended and staff has proposed conditions of certification **VIS-1**; **VIS-2**; **VIS-4, VIS-6,** and **VIS 7**. Those conditions will help minimize the transition from an agricultural to industrial setting.

3. Persons with views of the site would either live far enough from the site—at least one mile—to have a muted view or be moving or have their attention directed elsewhere. Most traffic in this industrial area is via I-580. Those drivers will be going at a rate of speed of at least 60 miles per hour, with their attention turned to the road in front of them. Consequently, viewers' exposure to the site would be low. However, the applicant has proposed and staff has recommended conditions of certification **VIS-1** through **VIS-7**, thus helping to further minimize any visual impacts.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 The project owner shall reduce the visibility of construction equipment, materials, and activities at the project site and as appropriate at any storage areas for staging, material, and equipment with temporary screening such as fabric attached to fencing or berms prior to the start of ground disturbance. Screening shall be of an appropriate height, design, opacity, and color for each specific location, as determined by the CPM.

The project owner shall submit to the CPM for review and approval a specific screening plan, the proper implementation of which shall satisfy the requirements listed in the previous paragraph. The project owner shall provide with the plan a sample (at least 3" x 5") of the proposed screening material.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the screening plan to the CPM for review and approval. The screening shall be installed during the site mobilization phase. The project owner shall notify the CPM when installation is completed.

The project owner shall provide the CPM with electronic color photographs after installing screening at the plant site, including the staging, material, and equipment storage areas, to demonstrate the effectiveness of the screening.

VIS-2 The project owner shall remove all evidence of construction activities, and shall restore the ground surface to the original condition or better condition, including the replacement of any vegetation or paving removed during construction where project development does not preclude this. The project owner shall submit to the CPM for review and approval a surface restoration plan the proper implementation of which will satisfy these requirements.

Verification: At least 60 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 surface restoration plan are needed, within 30 days of receiving that notification the project owner shall submit to the CPM a plan with the specified revisions.

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 completion of surface restoration that the restoration is ready for inspection.

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 and security.

B. All fixed position lighting shall be shielded/hooded, and directed downward and toward the area to be illuminated to prevent direct illumination of the night sky and direct light trespass (direct light extending outside the boundaries of the power plant site or the site of construction of ancillary facilities, including any security related boundaries).

C. Wherever feasible and safe and not needed for security, lighting shall be kept off when not in use.

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 requires modifications to the lighting, 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.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the General Conditions section including a proposal to resolve the complaint, and a schedule for implementation. The project owner shall notify the CPM within 48 hours after completing implementation of the proposal. A copy of the complaint resolution form report shall be included in the subsequent Monthly Compliance Report.

VIS-4 GWF Tracy will extend the footprint of the current Tracy Peaker Project approximately four acres. Applicant has proposed continuing for those four acres the landscaping plan as proposed in Condition of Certification **VIS-1**, as modified in the *Supplement to Staff Assessment on Tracy Peaker Project*; California Energy Commission, February 1, 2002.

This Condition of Certification **VIS-4**, designed to ensure the continuation of this previously-approved landscaping plan, requires the continuation of the planting of Fremont cottonwoods (Populus fremontii); western rebud (cercis occidentalis); and elderberry (sambucus Mexicana) trees along the northern, eastern, and western edges of the four acres added to the site by the construction of GWF Tracy.

This landscaping plan will help to ensure that GWF Tracy blends in with its surroundings as well as complies with the County of San Joaquin's General Plan, Section VI, Resources, and with San Joaquin County's *Landscaping, Fencing, and Screening Manual.*

Verification: At least 30 (thirty) days prior to start of construction, the project owner shall submit the revised perimeter landscape plan to the San Joaquin County Community Development Department for review and comment and to the CPM for review and approval. This plan, designed to continue the landscaping of the same trees proposed for the TPP, shall consist of Fremont cottonwoods (Populus fremontii); western rebud (cercis occidentalis); and elderberry (sambucus mexicana) trees to be planted along the northern, eastern, and western edges of the entire site. The continuation of the previous landscaping plan to include the four acres added by the construction of GWF Tracy will help to blend GWF Tracy with its surroundings and comply with local ordinances.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 15 (fifteen) 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 7 (seven) days after completing installation of the landscape screening that the planting 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 the Annual Compliance Report.

VIS-5 To the extent feasible and consistent with safety and security considerations, the project owner shall design and install all permanent exterior lighting such that (1) lamps and reflectors are not visible from beyond the project site, including any off-site security buffer areas; (2) lighting does not cause excessive reflected glare; (3) direct lighting does not illuminate the nighttime sky; (4) illumination of the project and its immediate vicinity is minimized; and (5) the plan complies with local policies and ordinances.

The project owner shall submit simultaneously to the CPM and the San Joaquin County Community Development Department a lighting mitigation plan to ensure the following:

A. Location and direction of light fixtures shall be positioned according to the lighting mitigation requirements.

B. To aid in satisfying the lighting mitigation requirements, lighting shall be designed to consider setbacks of project features from the site boundary.

C. Lighting shall incorporate fixture hoods/shielding with light directed downward or toward the area to be illuminated.

D. Light fixtures visible from beyond the project boundary shall be fitted with cutoff angles sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security.

E. All lighting shall be of minimum necessary brightness consistent with operation safety and security

F. Lights in high illumination areas not occupied on a continuous basis—maintenance platforms, for instance—shall have in addition to hoods switches, timer switches, or motion detectors so that lights operate only when the area is occupied

G. Design the new 150-foot exhaust stacks and the 50-foot natural gas stack such that they shall not be lighted at night with hazard lighting (CH2M 2009f) – any steady task-related lighting on these structures shall remain off except when needed for human access.

Verification: At least 90 days prior to ordering any permanent exterior lighting, the project owner shall contact the CPM 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 simultaneously to San Joaquin County Community Development Department for review and comment a lighting mitigation plan.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by the CPM.

The project owner shall not order any exterior lighting until receiving CPM approval of the lighting mitigation plan.

Prior to commercial operation, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If after inspection 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 and are ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the Compliance General Conditions including a proposal to resolve the complaint, and a schedule for implementation. The project owner shall notify the CPM within 48 hours after completing implementation of the proposal. A copy of the complaint resolution form report shall be submitted to the CPM within 30 days.

VIS-6 The project owner shall treat the surfaces of all project structures and buildings visible to the public such that a) their colors minimize visual intrusion and contrast by blending with the landscape; b) their colors and finishes do

not create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive.

The project owner shall submit for CPM review and approval, a specific surface treatment plan that will satisfy these requirements. The treatment plan shall include:

A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed colors and finishes.

B. A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the colors and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system.

C. One set of color brochures or color chips showing each proposed color and finish.

D. One set of 11” x 17” color photo simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture, from Key Observation Points 1, 2, and 3 (locations shown on Figure 2 of the Final Staff Assessment).

E. A specific schedule for completion of the treatment.

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 in the field until the project owner receives notification of approval of the treatment plan by the CPM. Subsequent modifications to the treatment plan are prohibited without CPM approval.

Verification: At least 90 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM for review and approval and simultaneously to the San Joaquin County Community Development Department for review and comment.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revisions for review and approval by the CPM before any treatment is applied. Any modifications to the treatment plan must be submitted to the CPM for review and approval.

Prior to the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed and they are ready for inspection and shall submit one set of electronic color photographs from the same key observation points identified in (d) above.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify (a): the condition of the surfaces of all structures and buildings at the end of the reporting year; (b) maintenance activities that occurred during the reporting year; and (c) the schedule of maintenance activities for the next year.

VIS-7 GWF Tracy will extend the footprint of the current TPP approximately four acres. To ensure continuity with the fencing surrounding the current TPP, fencing shall be installed around the perimeter of the facility. The fencing shall be the same as installed around the perimeter of the TPP: six-foot high, two-inch mesh, non-reflective fabric chain link with sand-colored vertical PVC slats. All fences and walls for GWF Tracy shall be treated the same as fences and walls for the current TPP. That is, they shall be non-reflective and treated in appropriate colors or hues that minimize visual intrusion and contrast by blending with the surrounding landscape as well as with the existing fencing surrounding the TPP. Fences and walls for the project shall comply with any applicable requirements of the San Joaquin County Community Development Department that relate to visual resources or fencing.

Verification: Prior to ordering fences and walls, the project owner shall submit simultaneously to the CPM for review and approval and to the San Joaquin County Community Development Department for review and comment, design specifications for fences and walls and documentation of their conformance with any requirements of San Joaquin County Community Development Department.

The project owner shall not order fences and walls until the submittal is approved by the CPM.

REFERENCES

California *Streets and Highways Code*; Sections 260—263, Scenic Highways.

California Department of Transportation; www.dot.ca.gov/hq/LandArch/.

CEC2009b CEC / M. McLean (tn:52536) - Report of Conversation between M. McLean and City of Tracy Planning Department, dated 7/21/2009. Submitted to CEC/Docket Unit on 7/23/2009.

CEQA, California Environmental Quality Act, Appendix G, Environmental Checklist Form; http://ceres.ca.gov/topic/env_law/ceqa/guidelines/Appendix_G.html

City of Tracy, *Tracy Hills Specific Plan*, approved June 16, 1998; http://www.ci.tracy.ca.us/modules/dms/index.php

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“Draft Removal Action Workplan for the Tracy Railyard Available for Review and Comment.” Department of Toxic Substances Control, California Environmental Protection Agency; Fact Sheet, March 2008.

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APPENDIX VR-1

ENERGY COMMISSION VISUAL RESOURCE ANALYSIS EVALUATION CRITERIA

Energy Commission staff conducts a visual resource analysis evaluation as required by the California Environmental Quality Act (CEQA). The analysis is conducted according to Appendix G, “Environmental Checklist Form—Aesthetics,” California Environmental Quality Act (CEQA). The CEQA analysis requires that commission staff make a determination of impact ranging from “Adverse and Significant” to “Not Significant.”

Staff’s analysis is based on Key Observation Points or KOPs. A KOP is selected to be representative of the most critical view sheds from off-site locations where the project would be visible to the public—for example, recreational and residential areas, travel routes, bodies of water, as well as scenic and historic resources. Because it is not feasible to analyze all the views in which a proposed project would be seen, it is necessary to select KOPs that would most clearly display the visual effects of the proposed project. KOPs may also represent primary viewer groups who would potentially be affected by the project.

KOPs are taken to indicate existing conditions without the project and then modified to include a simulation of the project. Consequently, staff has a visual representation of the viewshed before and after the project was introduced and makes its analysis accordingly. Information about that analytical process follows.

VISUAL RESOURCE ANALYSIS WITHOUT PROJECT

When analyzing KOPs of existing conditions without the project, staff considers the following conditions: visual quality, viewer concern, visibility, number of viewers, duration of view. Those conditions are then factored into an overall rating of viewer exposure and viewer sensitivity. Information about each condition and rating follows.

Visual Quality

An expression of the visual impression or appeal of a given landscape and the associated public value attributed to the resource, visual quality is rated from *outstanding* to *low*. An outstanding rating is generally reserved for landscapes viewers might describe as picture-perfect.

Landscapes rated *outstanding* generally are memorable because of the way the components combine in a visual pattern. In addition, those landscapes are free from encroaching elements, thus retaining their visual integrity. Finally, landscapes with outstanding visual quality are visually coherent and harmonious when each element is considered as part of the whole. On the contrary, landscapes rated *low* are often dominated by visually discordant human alterations.

Viewer Concern

Viewer concern represents the reaction of a viewer to visible changes in the viewshed—an area of land visible from a fixed vantage point. For example, viewers have a high

expectation for views formally designated as a scenic area or travel corridor as well as for recreational and residential areas. Viewers generally expect that those views will be preserved. Travelers on highways and roads, including those in agricultural areas, are generally considered to have moderate viewer concerns and expectations.

However, viewers tend to have low-to-moderate viewer concern when viewing commercial buildings. And Industrial uses typically have the lowest viewer concern. Regardless, the level of concern could be lower if the existing landscape contains discordant elements. In addition, some areas of lower visual quality and degraded visual character may contain particular views of substantially higher visual quality or interest to the public

Visibility

Visibility is a measure by which an object can be seen either from the surrounding community or vantage points. Visibility depends on the angle or direction of views; extent of visual screening; and topographical relationships between the object and existing homes, streets, or parks. In that sense, visibility is determined by considering any and all obstructions that may be in the sightline—trees and other vegetation; buildings; transmission poles or towers; general air quality conditions such as haze; and general weather conditions such as fog.

Number of Viewers

Number of viewers is a measure of the number of viewers per day who would have a view of the proposed project. *Number of viewers* is organized into the following categories: residential according to the number of residences; motorist according to the number of vehicles; and recreationists.

Duration of View

Duration of view is a function of the time needed to view the site. For example, a high or extended view of a project site is one reached across a distance in two minutes or longer. In contrast, a low or brief duration of view is reached in a short amount of time—generally less than ten seconds.

Viewer Exposure

Viewer exposure is a function of three elements previously listed, *visibility*, *number of viewers*, and *duration of view*. Viewer exposure can range from a *low* to *high*. A partially obscured and brief background view for a few motorists represents a low value; and unobstructed foreground view from a large number of residences represents a high value.

Visual Sensitivity

Visual sensitivity is function of three elements previous listed, *visual quality*, *viewer concern*, and *viewer exposure*. Viewer sensitivity tends to be higher for homeowners or people driving for pleasure or engaged in recreational activities and lower for people driving to and from work or as part of their work.

VISUAL RESOURCE ANALYSIS WITH PROJECT

Visual resource analyses with photographic simulations of the project involve the elements of contrast, dominance, view blockage, and visual change. Information about each element follows.

Contrast

Contrast concerns the degree to which a project's visual characteristics or elements—form, line, color, and texture—differ from the same visual elements in the existing landscape. The degree of contrast can range from *low* to *high*. A landscape is with similar forms, lines, colors, and textures as those in the landscape is more visually absorbent; that is, more capable of accepting those project's characteristics than a landscape in which those elements are absent.[8] Generally, visual absorption is inversely proportional to visual contrast.

Dominance

Dominance is a measure of (a) the proportion of the total field of view occupied by the field; (b) a feature's apparent size relative to other visible landscape features; and (c) the conspicuousness of the feature due to its location in the view.

A feature's level of dominance is lower in a panoramic setting than in an enclosed setting with a focus on the feature itself. A feature's level of dominance is higher if it is (1) near the center of the view; (2) elevated relative to the viewer; or (3) has the sky as a backdrop. As the distance between a viewer and a feature increases, its apparent size decreases; and consequently, its dominance increases. The level of dominance ranges from *low* to *high*.

View Blockage

The extent to which any previously visible landscape features are blocked from view constitutes view disruption. The view is also disrupted when the continuity of the view is interrupted. When considering a project's features, higher quality landscape features can be disrupted by lower quality project features, thus resulting in adverse visual impacts. The degree of view disruption can range from *none* to *high*.

Visual Change

Visual change is a function of *contrast*, *dominance*, and *view disruption*. Generally, *contrast* and *dominance* contribute more to the degree of visual change than does *view disruption*.

[8] Typically, the Energy Commission does not consider texture in its visual analyses.

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APPENDIX VR-2
VISIBLE PLUME MODELING ANALYSIS

William Walters, P.E.

INTRODUCTION

The following provides the assessment of the Tracy Power Plant (Tracy) gas turbine heat recovery steam generator (HRSG) exhaust stack visible plumes. Staff completed a modeling analysis for the applicant's proposed unabated gas turbine/HRSG design.

PROJECT DESCRIPTION

The proposed amended project would utilize two GE 7EA frame gas turbine/HRSGs with duct burners and one air-cooled condenser for project cooling.

Additionally, there is a proposed 85 MMBtu/hr auxiliary boiler and a wet surface air condenser (WSAC) that could create visible plumes. The auxiliary boiler will only operate when the gas turbines and duct burners are not operating and the small size of the boiler, well less than one tenth of the fuel input of each gas turbine, will limit the frequency and size of the plumes to a degree that they are not considered to have the potential to create a significant visible plume impact.

The wet surface air condenser (WSAC) if operated with water sprays under very cold conditions could create a visible plume; however, the project design requires the use of spray water in the WSAC only under extremely hot conditions which eliminates the potential for visible plumes from the WSAC.

VISIBLE PLUME MODELING METHODS

PLUME FREQUENCY MODELING

The CSVP model was used to estimate plume frequency for the HRSG exhausts. This model provides conservative estimates of plume frequency based on both hourly exhaust parameters and ambient condition data to determine the plume frequency.

CLOUD COVER DATA ANALYSIS METHOD

Normally a plume frequency of 20% of seasonal (in this case November through April) daylight no rain/fog high visual contrast (i.e. "clear") hours is used to determine potential plume impact significance. However, the meteorological data set[9] used in the analysis did not have weather or cloud data, so the seasonal daylight plume frequency has been used and compared to other analysis to determine if the seasonal clear hours plume frequency would be above or below 20%.

[9] This analysis uses a three-year (1997 through 1999) Tracy Patterson Pass Road meteorological data previously obtained by staff. This meteorological station location is very close to the site, approximately 2.5 miles, and would provide representative temperature and relative humidity conditions.

If it is determined that the seasonal daylight clear hour plume frequency is greater than 20% then plume dimensions are determined, and a significance analysis of the plumes is included in the Visual Resources section of the Staff Assessment.

HRSG VISIBLE PLUME MODELING ANALYSIS

Staff evaluated the Applicant's AFC (GWF 2008a) and performed an independent psychrometric 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, the frequency of visual plumes can be estimated. The operating data for these stacks are provided in **Visible Plume Table 1**.

Visible Plume Table 1
HRSG Exhaust Parameters [a]

Parameter	**HRSG Exhaust Parameters**				
Stack Height	150 feet (45.72 meters)				
Stack Diameter	17.0 feet (5.18 meters)				
Ambient Conditions	Molecular [b] Weight	Moisture Mole (%)	Moisture Content (% by weight)	Exhaust Flow Rate (klb/hr)	Exhaust Temp (°F)
Full Load No Duct Firing					
15 °F	28.5	6.51	4.11	2,602	222
59 °F	28.4	7.34	4.65	2,391	213
115 °F	28.1	9.86	6.32	2,177	221
Full Load Peak Duct Firing					
15 °F	28.3	8.27	5.26	2,616	194
59 °F	28.3	9.25	5.88	2,405	188
115 °F	28.1	11.90	7.64	2,191	203

Source: AFC (GWF 2008a, Appendix 5.1B Table 5.1B-10)
Note(s): a. Values were extrapolated or interpolated between hourly ambient condition data points as necessary.
b. Estimated based on calculated moisture content.
c. Calculated by difference of wet actual cubic feet per minute and dry standard cubic feet per minute.

HRSG VISIBLE PLUME MODELING ANALYSIS

Staff modeled the HRSG plumes using the CSVP model with a three-year meteorological data set from Tracy. **Visible Plume Table 2** provides the CSVP model visible plume frequency results for duct firing and non-duct firing operations.

Visible Plume Table 2
Staff Predicted Hours with HRSG Steam Plumes
Tracy 1997-1999 Meteorological Data

Case	Available (hr)	Full Load No Duct Firing		Full Load Peak Duct Firing	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	26,280	394	1.50%	3,392	12.91%
Daylight Hours	13,374	129	0.96%	942	7.04%
Seasonal Daylight Hours	6,000	129	2.15%	931	15.52%

The applicant has identified a potential duct firing frequency of 3,100 hours per year. Staff believes that duct firing will likely occur less often than this and would generally occur during summer peak demand periods rather than the colder periods where plumes are more likely to form.

A visible plume frequency of 20% of seasonal (November through April) daylight clear hours is used as a plume impact study threshold trigger. Staff has performed dozens of other visible plume analyses and has found that when the daylight plume frequency is less than 10% then seasonal daylight clear plume frequency will be less than 20%. Using this relationship and the likelihood of duct firing operation during cold weather conditions conducive to visible plume formation, staff has determined that the visible plume frequencies for this project are predicted to be well less than 20% of seasonal daylight clear hours.

CONCLUSIONS

Visible water vapor plumes from the proposed Tracy gas turbine/HRSG exhausts are expected to occur infrequently, well below 20% of seasonal daylight clear hours. Therefore, no further visual impact analysis of the expected plume sizes has been completed.

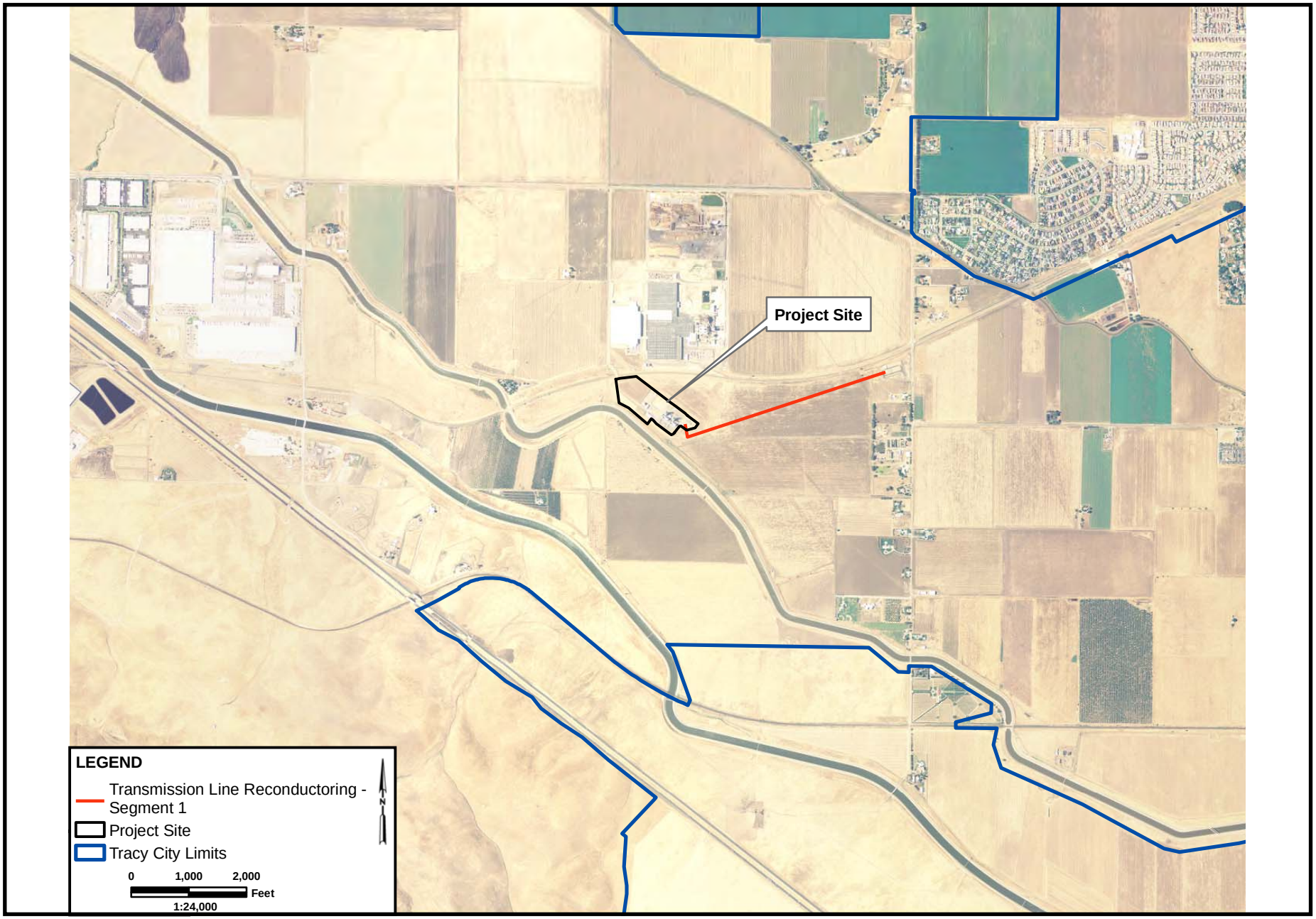
No visible water vapor plumes will be emitted from the air cooled condenser, and visible plumes are not expected to be emitted from the small auxiliary boiler.

REFERENCES

GWF 2008a - GWF Energy LLC/D. Wheeler (tn: 47105). Application for Certification for GWF Tracy Combined Cycle Power Plant Project, dated 7/10/2008. Submitted to CEC/Docket Unit on 7/18/2008.

VISUAL RESOURCES - FIGURE 1

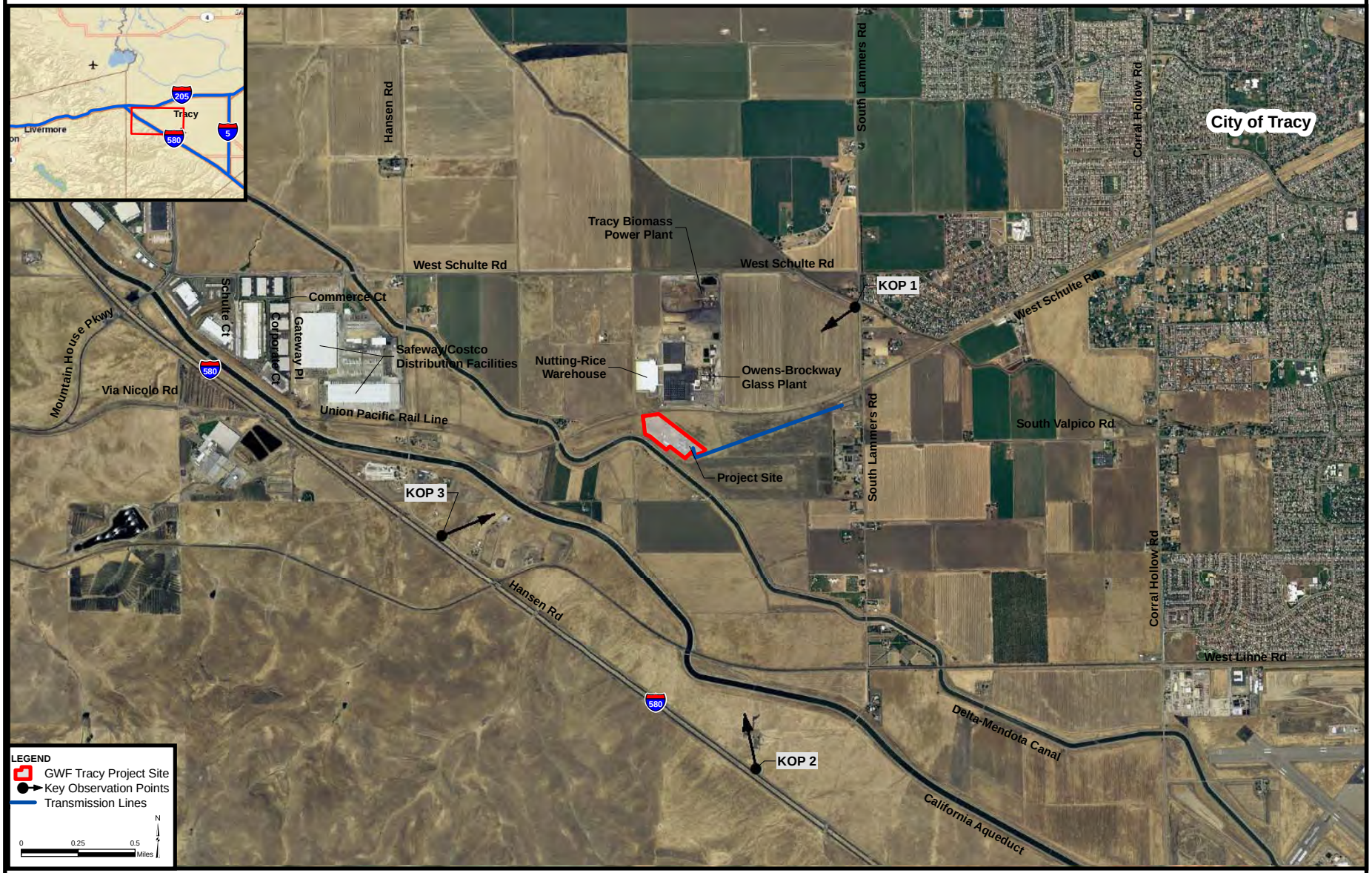
GWF Tracy Combined Cycle Power Plant Project - Location Map



SOURCE: AFC Figure 1.1-2

VISUAL RESOURCES - FIGURE 2

GWF Tracy Combined Cycle Power Plant Project - KOP Location Map



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SOURCE: AFC Figure 5.13-1

VISUAL RESOURCES - FIGURE 3

GWF Tracy Combined Cycle Power Plant Project - KOP 1 - Existing View Looking Southwest from South Lammers Road and West Schulte Road

SOURCE: AFC Figure 5.13-2B

VISUAL RESOURCES - FIGURE 4

GWF Tracy Combined Cycle Power Plant Project - KOP 1 - Visual Simulation Looking Southwest from South Lammers Road and West Schulte Road

Plantings shown at five-years' growth.

SOURCE: AFC Figure 5.13-2B

VISUAL RESOURCES - FIGURE 5

GWF Tracy Combined Cycle Power Plant Project - KOP 2 - Existing View Looking Southeast from Interstate 580

SOURCE: AFC Figure 5.13-3A

VISUAL RESOURCES - FIGURE 6

GWF Tracy Combined Cycle Power Plant Project - KOP 2 - Simulation View Looking Southeast from interstate 580

Plantings shown at five-years' growth.

SOURCE: AFC Figure 5.13-3B

VISUAL RESOURCES - FIGURE 7

GWF Tracy Combined Cycle Power Plant Project - KOP 3 - Existing View Looking Southwest from Hansen Road

SOURCE: AFC Figure 5.13-4A

VISUAL RESOURCES - FIGURE 8

GWF Tracy Combined Cycle Power Plant Project - KOP 3 - Simulated View Looking Southwest from Hansen Road

Plantings shown at five-years' growth.

SOURCE: AFC Figure 5.13-4B

VISUAL RESOURCES FIGURE 9

GWF Tracy Combined Cycle Power Plant Project - Intervenors' Property Locations

CALIFORNIA ENERGY COMMISSION, ENERGY FACILITIES SITING DIVISION, OCTOBER 2009

SOURCE: Google Earth - Specific Plan Tracy Hills Development, City of Tracy

WASTE MANAGEMENT

Testimony of Steve Radis

SUMMARY OF CONCLUSIONS

Management of the waste generated during construction and operation of the GWF Tracy Combined Cycle Power Plant (GWF Tracy) Project would not result in any significant adverse impacts and would comply with applicable waste management laws, ordinances, regulations, and standards if the measures proposed in the Application for Certification and staff's proposed conditions of certification are implemented.

INTRODUCTION

This Final Staff Assessment (FSA) presents an analysis of issues associated with wastes generated from the proposed construction and operation of the GWF Tracy Project. The technical scope of this analysis encompasses solid wastes existing on site and those to be generated during facility construction and operation. Management and discharge of wastewater is addressed in the **SOIL AND WATER RESOURCES** section of this document. Additional information related to waste management may also be covered in the **WORKER SAFETY** and **HAZARDOUS MATERIALS MANAGEMENT** sections of this document.

The Energy Commission staff's objectives in conducting this waste management analysis are to ensure that:

- The management of project wastes would 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 would be managed in an environmentally safe manner.
- The disposal of project wastes would not result in significant adverse impacts to existing waste disposal facilities.
- Upon project completion, the site is managed in such a way that project wastes and waste constituents would not pose a significant risk to humans or the environment.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local environmental laws, ordinances, regulations, and standards (LORS) have been established to ensure the safe and proper management of both solid and hazardous wastes in order to protect human health and the environment. Project compliance with the various LORS is a major component of staff's determination regarding the significance and acceptability of the GWF Tracy Project with respect to management of waste.

Waste Management Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Title 42, United States Code, §§ 6901, et seq. Solid Waste Disposal Act of 1965 (as amended and revised by the Resource Conservation and Recovery Act of 1976, et al.)	The Solid Waste Disposal Act, as amended and revised by the Resource Conservation and Recovery Act (RCRA) et al., establishes requirements for the management of solid wastes (including hazardous wastes), landfills, underground storage tanks, and certain medical wastes. The statute also addresses program administration, implementation, and delegation to states, enforcement provisions, and responsibilities, as well as research, training, and grant funding provisions. RCRA Subtitle C establishes provisions for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing: • Generator record keeping practices that identify quantities of hazardous wastes generated and their disposition; • Waste labeling practices and use of appropriate containers; • Use of a manifest when transporting wastes; • Submission of periodic reports to the United States Environmental Protection Agency (U.S. EPA) or other authorized agency; and • Corrective action to remediate releases of hazardous waste and contamination associated with RCRA-regulated facilities. • RCRA Subtitle D establishes provisions for the design and operation of solid waste landfills. RCRA is administered at the federal level by U.S. EPA and its 10 regional offices. The Pacific Southwest regional office (Region 9) implements U.S. EPA programs in California, Nevada, Arizona, and Hawaii.
Title 40, Code of Federal Regulations (CFR), Subchapter I – Solid Wastes	These regulations were established by U.S. EPA to implement the provisions of the Solid Waste Disposal Act and RCRA (described above). Among other things, the regulations establish the criteria for classification of solid waste disposal facilities (landfills), hazardous waste characteristic criteria and regulatory thresholds, hazardous waste generator requirements, and requirements for management of used oil and universal wastes. U.S. EPA implements the regulations at the federal level. However, California is an authorized state so the regulations are implemented by state agencies and authorized local agencies in lieu of U.S. EPA.
State	
California Health and Safety Code, Chapter 6.5, §§25100, et seq.	This California law creates the framework under which hazardous wastes must be managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA program. It also provides for the designation of California-only hazardous wastes and development of standards (regulations) that are equal to or, in some cases, more stringent than federal requirements.

Applicable Law	Description
Hazardous Waste Control Act of 1972, as amended	The California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) administers and implements the provisions of the law at the state level. Certified Unified Program Agencies (CUPAs) implement some elements of the law at the local level.
Title 22, California Code of Regulations (CCR), Division 4.5 Environmental Health Standards for the Management of Hazardous Waste	These regulations establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with the federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers, prepare manifests before transporting the waste off site, and use only permitted treatment, storage, and disposal facilities. Generator standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters. The Title 22 regulations are established and enforced at the state level by DTSC. Some generator standards are also enforced at the local level by CUPAs.
California Health and Safety Code, Chapter 6.11 §§ 25404–25404.9 Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)	The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the six environmental and emergency response programs listed below. • Aboveground Storage Tank Program • Business Plan Program • California Accidental Release Prevention (CalARP) Program • Hazardous Material Management Plan / Hazardous Material Inventory Statement Program • Hazardous Waste Generator / Tiered Permitting Program • Underground Storage Tank Program The state agencies responsible for these programs set the standards for their programs while local governments implement the standards. The local agencies implementing the Unified Program are known as Certified Unified Program Agencies (CUPAs). San Joaquin County Environmental Health Department (EHD).is the area CUPA. Note: The Waste Management analysis only considers application of the Hazardous Waste Generator/Tiered Permitting element of the Unified Program. Other elements of the Unified Program may be addressed in the Hazardous Materials and/or Worker Health and Safety analysis sections.
Public Resources Code, Division 30, §§ 40000, et seq. California Integrated Waste Management Act of 1989.	The California Integrated Waste Management Act of 1989 (as amended) establishes mandates and standards for management of solid waste. Among other things, the law includes provisions addressing solid waste source reduction and recycling, standards for design and construction of municipal landfills, and programs for county waste management plans and local implementation of solid waste requirements.

Applicable Law	Description
Title 14, CCR, Division 7, § 17200, et seq. California Integrated Waste Management Board	These regulations further implement the provisions of the California Integrated Waste Management Act and set forth minimum standards for solid waste handling and disposal. The regulations include standards for solid waste management, as well as enforcement and program administration provisions.
Local	
San Joaquin County General Plan (February 2005) – Public Health and Safety Section	Provides guidance for siting and management of facilities that store, collect, treat, dispose or transfer hazardous waste and hazardous materials. The project would be required to comply with the County's Hazardous Materials stipulations as put forth in the General Plan, Public Health and Safety Section.
San Joaquin County, Community Development Department, Code Enforcement	Incorporates by reference the CA HSC Division 20, Chapter 6.11 which requires the facility to operate as a unified program facility. The project would be required to operate as a unified program facility and would comply with San Joaquin County Environmental Health Department's Hazardous Materials Division (HMD) requirements concerning storage and handling of hazardous materials and wastes and would also cooperate on resolution of environmental issues at the site.
San Joaquin County Public Works, Solid Waste Division, various programs	Provides guidance for local management of solid waste and household hazardous waste (incorporates the County's Source Reduction and Recycling Elements, which detail means of reducing commercial and industrial sources of solid waste).
San Joaquin County Environmental Health Department various programs	San Joaquin County HMD would serve as the Certified Unified Program Agency (CUPA) for the project. The CUPA regulates and conducts inspections of businesses that handle hazardous materials, hazardous wastes, and/or have underground storage tanks. The proposed project would be required to comply with HMD requirements concerning storage and handling of hazardous materials and wastes and would also cooperate on resolution of environmental issues at the site.

SETTING

GWF proposes to modify the existing Tracy Peaker Project (TPP), a nominal 169-megawatt (MW) simple-cycle power plant, by converting the facility into a combined-cycle power plant with a nominal 145 MW net of additional generating capacity. Please see **PROJECT DESCRIPTION**. Activities that would impact waste management include:

- Facility construction activities;
- Demolition and removal of the two existing oxidation catalyst and selective catalytic reduction (SCR) systems, including existing 100-foot stacks;

- Demolition of the existing stormwater evaporation/percolation basin to accommodate the air-cooled (dry) condenser (ACC) unit on the existing site;
- Placement of two 45-foot-tall, 5.5-foot-diameter, tubular steel transmission structures to facilitate a connection into the existing 115-kV Tesla-Manteca transmission line;
- Reconductoring of three short segments of the electrical transmission line (totaling approximately three miles) downstream of the first point of interconnection (one 0.7-mile segment adjacent to the GWF Tracy site, and two segments, approximately 1.6 miles and 0.7 mile, respectively, near the intersection of I-5 and I-205 near the Kasson Substation); and
- Increase in industrial wastewater during operations.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

This waste management analysis addresses: a) existing project site conditions and the potential for contamination associated with prior activities on or near the project site, and b) the impacts from the generation and management of wastes during project construction and operation.

Existing Project Site Conditions and Potential for Contamination from Prior Activities

For any site in California proposed for the construction of a power plant, the applicant must provide documentation about the nature of any potential or existing releases of hazardous substances or contamination at the site. If potential or existing releases or contamination at the site are identified, the significance of the release or contamination would be determined by site-specific factors, including, but not limited to: the amount and concentration of contaminants or contamination; the proposed use of the area where the contaminants/contamination is found; and any potential pathways for workers, the public, or sensitive species or environmental areas to be exposed to the contaminants. Any unmitigated contamination or releases of hazardous substances that pose a risk to human health or environmental receptors would be considered significant by Energy Commission staff.

As a first step in documenting existing site conditions, the Energy Commission's power plant site certification regulations require that a Phase I Environmental Site Assessment (ESA) be prepared[1] and submitted as part of an application for certification. The Phase I ESA is conducted to identify any conditions indicative of releases and threatened releases of hazardous substances at the site and to identify any areas known to be contaminated (or a source of contamination) or near the site.

In general, the Phase I ESA uses a qualified environmental professional to conduct inquiries into past uses and ownership of the property, research hazardous substance

[1] Title 20, California Code of Regulations, section 1704(c) and Appendix B, section (g)(12)(A). Note that the Phase I ESA must be prepared according to American Society for Testing and Materials protocol or an equivalent method agreed upon by the applicant and the Energy Commission staff.

releases and hazardous waste disposal at the site and within a certain distance of the site, and visually inspect the property, making observations about the potential for contamination and possible areas of concern. After conducting all necessary file reviews, interviews, and site observations, the environmental professional then provides findings about the environmental conditions at the site. In addition, since the Phase I ESA does not include sampling or testing, the environmental professional may also give an opinion about the potential need for any additional investigation. Additional investigation may be needed, for example, if there were significant gaps in the information available about the site, an ongoing release is suspected, or to confirm an existing environmental condition.

If additional investigation is needed to identify the extent of possible contamination, a Phase II ESA may be required. The Phase II ESA usually includes sampling and testing of potentially contaminated media to verify the level of contamination and the potential for remediation at the site.

In conducting its assessment of a proposed project, Energy Commission staff would review the project's Phase I ESA and work with the appropriate oversight agencies as necessary to determine if additional site characterization work is needed and if any mitigation is necessary at the site to ensure protection of human health and the environment from any hazardous substance releases or contamination identified.

Impacts from Generation and Management of Wastes During Construction and Operation

Regarding the management of project-related wastes generated during construction and operation of the proposed project, staff reviewed the applicant's proposed solid and hazardous waste management methods and determined if the methods proposed are consistent with the LORS identified for waste disposal and recycling. The federal, state, and local LORS represent a comprehensive regulatory system designed to protect human health and the environment from impacts associated with management of both non-hazardous and hazardous wastes. Absent any unusual circumstances, staff considers project compliance with LORS to be sufficient to ensure that no significant impacts would occur as a result of project waste management.

Staff then reviewed the capacity available at off-site treatment and disposal sites and determines whether or not the proposed power plant's waste would have a significant impact on the volume of waste a facility is permitted to accept. Staff used a waste volume threshold equal to 10% of a disposal facility's remaining permitted capacity to determine if the impact from disposal of project wastes at a particular facility would be significant.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Existing Site Conditions

A Phase I Environmental Site Assessment (ESA) was performed at the site for the original TPP to determine if contamination was present that would require removal or remediation. The proposed GWF Tracy is located within the footprint of TPP with the exception of two termination structures (two 45-foot-tall, 5.5-foot-diameter, tubular steel

transmission structures to facilitate a connection into the existing 115-kV Tesla-Manteca transmission line) and the relocated stormwater retention basin and equipment storage area. Both of these items, however, are located within an area that was previously disturbed during construction of the TPP, and are also located within the 40-acre parcel identified as part of the ESA.

A Phase I ESA was conducted by Harding Engineering and Environmental Services in July 2001 in accordance with American Society of Testing and Materials (ASTM) Standard E 1527-05, Standard Practice for ESAs. An updated ESA was prepared by MacTec in June 2008 for the proposed GWF Tracy project (Appendix 5.14A); with copies of the updated ESA being provided to the Energy Commission under separate cover.

Based on records review, site reconnaissance, and interviews, a determination was made by Harding Engineering and Environmental Services that the site appears to have been historically used for agricultural purposes since 1957. No recognized environmental conditions were identified at the site, and no offsite locations of environmental significance were identified within the ASTM search distance of one mile from the GWF Tracy site. Harding Engineering and Environmental Services determined that pesticides were likely in the soil due to past agricultural activities at the site. As a result of this determination, soil samples were taken and analyzed for pesticide residue. Results of this analysis determined that pesticides were not present in levels above regulatory limits.

Energy Commission staff notes that the Phase I ESA shows the site was used for commercial agriculture prior to the construction of the GWF Tracy power plant. This type of use indicates there is potential for impacts from hazardous pesticides used at the site but that are not readily observed at the surface due to agricultural tilling. Staff has proposed Conditions of Certification **WASTE-1** and **WASTE-2** to mitigate potential impacts. These proposed conditions of certification require that a registered professional geologist or engineer with experience in remedial investigation and feasibility studies be available for consultation during soil excavation and grading activities. This would be adequate to address identification and investigation of any soil or groundwater contamination that may be encountered.

Construction Impacts and Mitigation

Site preparation and construction of the proposed power plant and associated facilities would generate both non-hazardous and hazardous wastes in solid and liquid forms (GWF 2008a, § 5.14.4.1). Before construction can begin, the project owner would be required to develop and implement a Construction Waste Management Plan, per proposed Condition of Certification **WASTE-3**.

Non-Hazardous Wastes

Non-hazardous solid wastes generated during construction would include approximately 150 tons of scrap wood, concrete, steel/metal, paper, glass, and plastic waste (GWF 2008a, § 5.14.4.1.1). All non-hazardous wastes would be recycled to the extent possible

and non-recyclable wastes would be collected by a licensed hauler and disposed in a solid waste disposal facility, in accordance with Title 14, California Code of Regulations, sections 17200 et seq.

Paper, wood, glass, and plastics would be generated from packing materials, waste lumber, insulation, and empty non-hazardous chemical containers. Approximately 80 tons of these wastes would be generated during construction. These wastes would be recycled where practical. Waste that cannot be recycled would be disposed of weekly in a Class III landfill by a local waste disposal company. On site, the waste would be placed in dumpsters.

Metal would include steel from welding/cutting operations, packing materials, and empty non-hazardous chemical containers. Aluminum waste would be generated from packing materials and electrical wiring. Approximately 10 tons of waste metal would be generated during construction. Waste would be recycled where practical with Delta Metals and non-recyclable waste would be deposited in a Class III landfill.

Approximately 60 tons of excess concrete would be generated during construction. Waste concrete would be disposed of in a Class III landfill or at clean fill sites, if available, or would be recycled and disposed of at a construction and debris (C&D) landfill.

Non-hazardous solid waste generated during construction would be collected in onsite dumpsters and picked up periodically by Tracy Delta Solid Waste Management, Inc. The waste would then be taken to the Tracy Material Recovery and Transfer Facility and handled according to the San Joaquin County Waste Diversion Program. Recyclable materials would be segregated and transported by construction contractors or other private haulers to an area recycling facility.

Non-hazardous liquid wastes would also be generated during construction, including sanitary wastes, dust suppression drainage, and equipment wash water. Sanitary wastes would be collected in portable, self-contained toilets and pumped periodically for disposal at an appropriate facility. Potentially contaminated equipment wash water would be contained at designated wash areas and transported to a sanitary wastewater treatment facility. Please see the **SOIL AND WATER RESOURCES** section of this document for more information on the management of project wastewater.

Stormwater runoff would be managed in accordance with the contractor-developed stormwater pollution prevention plan (SWPPP) that must be approved by the appropriate agencies prior to the start of construction. Please see the **SOIL AND WATER RESOURCES** section of this document for more information on the management of project storm water.

Hazardous Wastes

The generation of hazardous wastes anticipated during construction includes small amounts of contaminated soil or other solids and small volumes of waste oil, waste glycol, cleaning fluids, solvents, paints, batteries, lighting lamps, and welding materials. Many of these wastes would be recycled under the “excludable recyclable” provision of

Title 22 of the California Health and Safety Code. The amount of waste generated would be minor if handled in the manner identified in the AFC (GWF 2008a, § 5.14.4.1.1).

Most of the hazardous waste generated during construction would consist of liquid waste, such as flushing and cleaning fluids, passivating fluid (to prepare pipes for use), and solvents. Some hazardous solid waste, such as welding materials and dried paint, may also be generated.

Flushing and cleaning waste liquid would be generated when pipes and boilers are cleaned and flushed. Passivating fluid waste is generated when high temperature pipes are treated with either a phosphate or nitrate solution. The volume of flushing, cleaning and passivating liquid waste generated is estimated to be one to two times the internal volume of the pipes cleaned. The quantity of welding, solvent, and paint waste is expected to be minimal.

The construction contractor would be considered the generator of hazardous construction waste, and would be responsible for proper handling of hazardous waste in compliance with all applicable federal, state, and local laws and regulations, including licensing, personnel training, accumulation limits and times, and reporting and recordkeeping.

The project owner would be required to obtain a unique hazardous waste generator identification number for the site prior to starting construction, pursuant to proposed Condition of Certification **WASTE-4**. Although the hazardous waste generator number is determined based on site location, both the construction contractor and the project owner/operator could be considered the generator of hazardous wastes at the site. Wastes would be accumulated on site for less than 90 days and then properly manifested, transported, and disposed at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies. Staff reviewed the disposal methods described in AFC section 5.14.4.1.3 and concluded that all wastes would be disposed in accordance with all applicable LORS. Should any construction waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed Condition of Certification **WASTE-5** to notify the Energy Commission's Compliance Project Manager (CPM) whenever the owner becomes aware of any such action.

In the event that construction excavation, grading, or trenching activities for the proposed project encounter potentially contaminated soils and/or specific handling, disposal, and other precautions that may be necessary pursuant to hazardous waste management LORS, staff finds that proposed Conditions of Certification **WASTE-1** and **WASTE-2** would be adequate to address any soil contamination contingency that may be encountered during construction of the project and would ensure compliance with LORS. Absent any unusual circumstances, staff considers project compliance with LORS to be sufficient to ensure that no significant impacts would occur as a result of project waste management activities.

Operation Impacts and Mitigation

The proposed GWF Tracy Project would generate non-hazardous and hazardous wastes in both solid and liquid forms under normal operating conditions. (Table 5.14-2 of the project AFC gives a summary of the operation waste streams, expected waste volumes and generation frequency, and management methods proposed.) Before operations can begin, the project owner would be required to develop and implement an Operation Waste Management Plan pursuant to proposed Condition of Certification **WASTE-6**.

Non-Hazardous Solid Wastes

GWF Tracy would produce maintenance and generating facility wastes typical of power generation operations. These would include rags, turbine air filters, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, the typical refuse generated by workers and small office operations, and other miscellaneous solid wastes. The quantity generated is estimated to be about five tons per year (GWF 2008a, § 5.14.4.2.1). Large metal parts would be recycled. All non-hazardous wastes would be recycled to the extent possible, and non-recyclable wastes would be regularly transported off site to a local solid waste disposal facility.

Non-Hazardous Liquid Wastes

Non-hazardous liquid wastes would be generated during facility operation and are discussed in the **SOIL AND WATER RESOURCES** section of this document. As described in this section, the GWF Tracy wastewater collection system would collect sanitary wastewater from sinks, toilets, and other sanitary facilities, and would be managed by the existing septic tank and leach field system.

General facility drainage would consist of area washdown, sample drains, equipment leakage, and drainage from facility equipment areas. Water from these areas would be collected in a system of floor drains, hub drains, sumps, and piping, and routed to the facility wastewater collection system. Drains that could contain oil or grease would be routed through an oil/water separator. Water from the plant wastewater collection system would be discharged to a holding tank. Wastewater from combustion turbine water washes would also be collected in a holding tank. Wastewater would be trucked off site for disposal at an approved wastewater disposal facility.

Hazardous Wastes

The project owner/operator would be considered a generator of hazardous wastes at the site during facility operations. Therefore, the project owner's unique hazardous waste generator identification number, obtained prior to construction in accordance with proposed Condition of Certification **WASTE-4**, would be retained and used for hazardous waste generated during facility operation.

Hazardous waste generated during operation would include waste lubricating oil, used oil filters, spent selective catalytic reduction (SCR) and oxidation catalysts, and chemical cleaning wastes. The catalyst units would contain heavy metals that are considered hazardous.

The chemical feed area drains would collect spillage, tank overflows, effluent from maintenance operations, and liquid from area washdowns. After testing, water collected from the chemical storage areas would be directed to the oil/water separator and shipped off site for disposal.

In addition, spills and unauthorized releases of hazardous materials or hazardous wastes may generate contaminated soils or materials that may require corrective action and management as hazardous waste. Proper hazardous material handling and good housekeeping practices would help keep spill wastes to a minimum. However, to ensure proper cleanup and management of any contaminated soils or waste materials generated from hazardous materials spills, staff proposes Condition of Certification **WASTE-7** requiring the project owner/operator to report, clean up, and remediate as necessary, any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements. More information on hazardous material management, spill reporting, containment, and spill control and countermeasures plan provisions for the project are provided in the **HAZARDOUS MATERIAL MANAGEMENT** section of the FSA.

The amount of hazardous wastes generated during the operation of GWF Tracy would be minor, with source reduction and recycling of wastes implemented whenever possible. The hazardous wastes would be temporarily stored on site, transported off site by licensed hazardous waste haulers, and recycled or disposed at authorized disposal facilities in accordance with established standards applicable to generators of hazardous waste (Title 22, CCR, §§ 66262.10 et seq.). Should any operations waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed Condition of Certification **WASTE-5** to notify the CPM whenever the owner becomes aware of any such action.

Impact on Existing Waste Disposal Facilities

Non-Hazardous Solid Wastes

During construction of the proposed project, approximately 150 tons of solid waste would be generated and recycled or disposed in a Class III landfill (GWF 2008a, § 5.14.4.1.1). The non-hazardous solid wastes generated yearly at GWF Tracy facility would also be recycled, if possible, or disposed in a Class III landfill.

Table 5.14-4 of the project AFC identifies four non-hazardous (Class III) waste disposal facilities that could potentially take the non-hazardous construction and operation wastes generated by GWF Tracy (one transfer station and three landfills). These Class III landfills are all located in San Joaquin or adjacent Alameda counties. The remaining capacity for the three landfills combined is over 120 million cubic yards. The total amount of non-hazardous waste generated from project construction and operation would contribute less than 1% of the available landfill capacity. Staff finds that disposal of the solid wastes generated by GWF Tracy can occur without significantly impacting the capacity or remaining life of any of these facilities.

Hazardous Wastes

Section 5.14.4.3.2 of the project AFC discusses the two Class I landfills in California: the Clean Harbor Landfill (Buttonwillow) in Kern County and the Chemical Waste Management Landfill (Kettleman Hills) in Kings County. The Kettleman Hills facility also accepts Class II and Class III wastes. In total, there is in excess of 15 million cubic yards of remaining hazardous waste disposal capacity at these landfills, with approximately 30 years of remaining operating lifetimes. GWF Tracy construction and operation waste would likely be sent to the Kettleman Hills facility.

In addition to hazardous waste landfills, there are numerous offsite commercial liquid hazardous waste treatment and recycling facilities in California. Some of the closest facilities include Clean Harbors and Noranda Recycling in San Jose, ECS Refining and J&B Enterprises in Santa Clara, Evergreen Oil in Newark, and Onyx Environmental Services in Richmond.

Hazardous wastes generated during construction and operation would be recycled to the extent possible and practical. Those wastes that cannot be recycled would be transported off site to a permitted treatment, storage, or disposal facility. The volume of hazardous waste from the GWF Tracy requiring off-site disposal would be far less than staff's threshold of significance and would therefore not significantly impact the capacity or remaining life of the Class I waste facilities.

CUMULATIVE IMPACTS AND MITIGATION

GWF Tracy would generate non-hazardous solid waste that would add to the total waste generated in San Joaquin County and in California. However, there is adequate recycling and landfill capacity in California to recycle and dispose of the waste generated by GWF Tracy, as well as any additional projects in the City of Tracy. It is estimated that GWF Tracy would generate approximately 152 tons of solid waste during construction (including approximately three tons of hazardous waste) and about five tons a year from operations (including less than one ton of solid hazardous waste). GWF Tracy's contribution would likely represent less than 1% of the county's total waste generation. Therefore, the impact of the project on solid waste recycling and disposal capacity would not be significant.

Hazardous waste generated would consist of waste oil, filters, SCR and oxidation catalysts, and fluids used to clean piping. The waste oil and catalysts would be recycled. Hazardous waste treatment and disposal capacity in California is more than adequate. Therefore, the effect of GWF Tracy on hazardous waste recycling, treatment, and disposal capability would not be significant.

As proposed, the amount of non-hazardous and hazardous wastes generated during construction and operation of the GWF Tracy Project would add to the total quantity of waste generated in the State of California. However, project wastes would be generated in modest quantities, waste recycling would be employed wherever practical, and sufficient capacity is available at several treatment and disposal facilities to handle the volumes of wastes that would be generated by the project. Therefore, staff concludes that the waste generated by the GWF Tracy Project would not result in significant cumulative waste management impacts.

COMPLIANCE WITH LORS

Energy Commission staff concludes that the proposed GWF Tracy Project would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during both facility construction and operation. The applicant is required to recycle and/or dispose hazardous and non-hazardous wastes at facilities licensed or otherwise approved to accept the wastes. Because hazardous wastes would be produced during both project construction and operation, the GWF Tracy Project would be required to obtain a hazardous waste generator identification number from U.S. EPA. The GWF Tracy Project would also be required to properly store, package, and label all hazardous waste; use only approved transporters; prepare hazardous waste manifests; keep detailed records; and appropriately train employees, in accordance with state and federal hazardous waste management requirements.

In the **SOCIOECONOMICS** section of this staff assessment, staff presents census information that shows that there are minority populations within one mile and six miles of the project. The population surrounding the GWF Tracy facility does not meet the definition of a disadvantaged population. Therefore, staff concludes that there would be no significant impact from construction or operation of the power plant on minority or low income populations. Therefore, there are no environmental justice issues for **WASTE MANAGEMENT**.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Howard L. Seligman (Seligman and Willett, Inc. on behalf of Charles Tuso, Steve Tuso and Annette Elissagaray, the co-owners of an approximately 275-acre parcel of agricultural property immediately adjacent proposed project site) submitted a letter questioning the potential increase of hazardous waste from the GWF Tracy facility. The analysis presented above identifies the amount of hazardous and non-hazardous waste associated with the GWF Tracy project. As indicated above, the impact on solid waste recycling and disposal capacity would not be significant, and the impact on hazardous waste recycling, treatment and disposal capacity would not be significant.

CONCLUSIONS

Consistent with the three main objectives for staff's waste management analysis (as noted in the Introduction section of this analysis), staff provides the following conclusions:

1. After review of the applicant's proposed waste management procedures, staff concludes that project wastes would be managed in compliance with all applicable waste management LORS. Staff notes that both construction and operation wastes would be characterized and managed as either hazardous or non-hazardous waste. All non-hazardous wastes would be recycled to the extent feasible, and non-recyclable wastes would be collected by a licensed hauler and disposed of at a permitted solid waste disposal facility. Hazardous wastes would be accumulated onsite in accordance with accumulation time limits (90,180, 270, or 365 days depending on waste type and volumes generated), and then properly manifested,

transported to, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies.

However, to help ensure and facilitate ongoing project compliance with LORS, staff proposes Conditions of Certification **WASTE-1** through **7**. These conditions would require the project owner to do all of the following:

- Ensure the project site is investigated and any contamination identified is remediated as necessary, with appropriate professional and regulatory agency oversight (**WASTE-1**, **2**, **4**, and **5**).
- Obtain a hazardous waste generator identification number (**WASTE-4**).
- Prepare Construction Waste Management and Operation Waste Management Plans detailing the types and volumes of wastes to be generated and how wastes will be managed, recycled, and/or disposed of after generation (**WASTE-3** and **6**).
- Ensure that all spills or releases of hazardous substances are reported and cleaned-up in accordance with all applicable federal, state, and local requirements (**WASTE-2)**.
- Report any waste management-related LORS enforcement actions and how violations will be corrected (**WASTE-5**).

2. Existing conditions at the GWF Tracy project site do include areas where prior site uses may have resulted in releases of hazardous substances or soil contamination. To ensure that the project site is investigated and remediated as necessary and to reduce any impacts from prior or future hazardous substance or hazardous waste releases at the site to a level of insignificance, staff proposes Conditions of Certification **WASTE-1**, **2**, **6**, and **7**. These conditions would require the project owner to ensure that the project site is investigated and remediated as necessary; demonstrate that project wastes are managed properly; and ensure that any future spills or releases of hazardous substances or wastes are properly reported, cleaned-up, and remediated as necessary. Therefore, staff concludes that construction and operation of the proposed GWF Tracy project would not result in contamination or releases of hazardous substances that would pose a substantial risk to human health or the environment.

3. Regarding impacts of project wastes on existing waste disposal facilities, staff uses a waste volume threshold equal to 10% of a disposal facility's remaining capacity to determine if the impact from disposal of project wastes at a particular facility would be significant. The existing available capacity for the three Class III landfills that may be used to manage non-hazardous project wastes exceeds 87 million cubic yards. The total amount of non-hazardous wastes generated from construction and operation of GWF Tracy would contribute less than 0.1% of the remaining landfill capacity. Therefore, disposal of project generated non-hazardous wastes would have a less than significant impact on Class III landfill capacity.

   In addition, the two Class I disposal facilities that could be used for hazardous wastes generated by the construction and operation of GWF Tracy have a combined remaining capacity in excess of 15 million cubic yards. The total amount of

hazardous wastes generated by the GWF Tracy project would contribute less than 0.02% of the remaining permitted capacity. Therefore, disposal of GWF Tracy generated hazardous wastes would have a less than significant impact on the remaining capacity at Class I landfills.

Staff concludes that management of the waste generated during demolition, construction and operation of the GWF Tracy project would not result in any significant adverse impacts, and would comply with applicable LORS, if the waste management practices and mitigation measures proposed in the GWF Tracy project AFC and staff's proposed conditions of certification are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall provide the resume of an experienced and qualified professional engineer or professional geologist, who shall be available for consultation during site characterization (if needed), demolition, excavation, and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.
The professional engineer or professional geologist shall be given full authority by the project owner 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 for review and approval.

WASTE-2 If potentially contaminated soil is identified during site characterization, demolition, excavation, or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of Department of Toxic Substances Control, and the CPM stating the recommended course of action. Depending on the nature and extent of contamination, the professional engineer or professional 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 professional engineer or professional geologist, significant remediation may be required, the project owner shall contact the CPM and representatives of the Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any final reports filed by the professional engineer or professional 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 prepare a Demolition and Construction Waste Management Plan for all wastes generated during demolition and construction of the facility and shall submit the plan to the CPM for review and

approval. The plan shall meet the requirements of the San Joaquin County Solid Waste Division Waste Diversion Plan and shall contain, at a minimum, the following:

1. A description of all construction waste streams, including projections of frequency, amounts generated, and hazard classifications;

2. A survey of structures to be demolished that identifies the types of waste to be managed;

3. Completed San Joaquin County, Solid Waste Division, Waste Diversion Forms (Form A - Construction and Form B - Demolition), and

4. Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.

Verification: The project owner shall submit the Construction Waste Management Plan to the CPM for approval no less than 30 days prior to the initiation of construction activities at the site.

WASTE-4 The project owner shall provide a hazardous waste generator identification number to the CPM prior to generating any hazardous waste during construction and operations.

Verification: The project owner shall provide the USEPA hazardous waste generator identification number to the CPM prior to the start of construction and maintain a copy of the identification number on file at the project site for the life of the project.

WASTE-5 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 would be required in the way project-related wastes are managed.

WASTE-6 The project owner shall update their current Operation Waste Management Plan for all wastes generated during operation of the modified facility and shall submit the plan to the CPM for review and approval. The plan shall meet

the requirements of the San Joaquin County Solid Waste Division Waste Diversion Plan. The plan shall contain, at a minimum, the following:

1. A detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;

2. Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;

3. Information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;

4. A detailed description of how facility wastes will be managed and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure;

5. Completed San Joaquin County, Solid Waste Division, Waste Diversion Forms (Form C – Operations Waste Diversion Plan), and

6. A detailed description of how facility wastes will be managed and disposed upon closure of the facility.

Verification: The project owner shall submit the Operation Waste Management Plan to the CPM for approval no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

WASTE-7 The project owner shall ensure that all spills or releases of hazardous substances, hazardous materials, or hazardous waste are reported, cleaned up, and remediated as necessary, in accordance with all applicable federal, state, and local requirements.

Verification: The project owner shall document all unauthorized releases and spills of hazardous substances, materials, or wastes that occur on the project property or related pipeline and transmission corridors. The documentation shall include, at a

minimum, the following information: location of release; date and time of release; reason for release; volume released; amount of contaminated soil/material generated; how release was managed and material cleaned up; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release. Copies of the unauthorized spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

REFERENCES

GWF 2008a. GWF Energy LLC/D. Wheeler (tn: 47105). Application for Certification for GWF Tracy Combined Cycle Power Plant Project, dated 7/10/2008. Submitted to CEC/Docket Unit on 7/18/2008.

GWF 2008e. GWF Energy LLC/D. Wheeler (tn: 47109). Appendix 5.14A Phase I Environmental Site Assessment, dated 7/18/2008. Submitted to CEC/Docket Unit on 7/18/2008.

WORKER SAFETY AND FIRE PROTECTION

Testimony of Alvin J. Greenberg, Ph.D. and Rick Tyler

SUMMARY OF CONCLUSIONS

Staff concludes that if the applicant for the proposed GWF Tracy Combined Cycle Power Plant (GWF Tracy) provides a Project Construction Safety and Health Program and a Project Operations and Maintenance Safety and Health Program, as required by Conditions of Certification **WORKER SAFETY-1** and **-2** and fulfills the requirements of Conditions of Certification **WORKER SAFETY-3** through **-6**, the project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable laws, ordinances, regulations, and standards. The proposed conditions of certification provide assurance that the Construction Safety and Health Program and the Operations and Maintenance Safety and Health Program proposed by the applicant would 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 laws, ordinances, regulations, and standards.

Staff also concludes that the proposed project would not have significant impacts on local fire protection services. The proposed project would be located within the existing Tracy Peaker Plant (TPP) in an area that is currently served by the local fire department. Staff has contacted the Tracy Fire Department for its view, however, in staff's opinion, the fire risks associated with the proposed expansion project do not pose significant added demands on local fire protection services. Staff also concludes that the Tracy Fire Department (TFD) is adequately equipped and staffed to respond to hazardous materials incidents at the proposed facility with an adequate response time.

INTRODUCTION

Worker safety and fire protection is regulated through laws, ordinances, regulations, and standards (LORS), at the federal, state, and local levels. Industrial workers at the facility operate equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to eliminate or reduce these hazards or to minimize the risk through special training, protective equipment, and procedural controls.

The purpose of this Final Staff Assessment (FSA) is to assess the worker safety and fire protection measures proposed by the GWF Tracy and to determine whether the applicant has proposed 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

Worker Safety and Fire Protection Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Title 29 U.S. Code (USC) section 651 et seq (Occupational Safety and Health Act of 1970)	This act mandates safety requirements in the workplace with the purpose of "[assuring] so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources" (29 USC § 651).
Title 29 Code of Federal Regulation (CFR) sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations)	These sections 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.
29 CFR sections 1952.170 to 1952.175	These sections provide federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the federal requirements found in 29 CFR sections 1910.1 to 1910.1500.
State	
Title 8 California Code of Regulations (Cal Code Regs.) all applicable sections (Cal/OSHA regulations)	These sections require that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to safety matters during construction, commissioning, and operations of power plants, as well as safety around electrical components, fire safety, and hazardous materials use, storage, and handling.
24 Cal Code Regs. section 3, et seq.	This section incorporates the current addition of the Uniform Building Code.
Health and Safety Code section 25500, et seq.	This section presents Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at a facility.
Health and Safety Code sections 25500 to 25541	These sections require a Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at a facility.
Local (or locally enforced)	
Uniform Fire Code	This code is enforced by the Tracy Fire Department and requires all places that store or use hazardous or flammable materials to apply for a permit.

SETTING

The proposed facility would be located in the city of Tracy within unincorporated San Joaquin County, California. Fire support services to the site would be under the jurisdiction of the city of Tracy Fire Department (TFD). The closest station to the GWF Tracy site would be Station #94, located at 16602 W. Schulte Road, approximately 1.8 mile west of the project site. The total response time from the moment a call is made to the point of arrival at the site would be approximately 3.5 minutes. The next closest station would be Station #97, located at 595 West Central Avenue, about five miles east of the project site, which would respond within 10.5 minutes ((GWF 2008a, Section 5.16.4.5 and TFD 2009).

Trained personnel at the GWF Tracy site would provide initial response to hazardous materials incidents with backup support provided by the TFD. The TFD has a Hazardous Materials Team at Station #96, located at 301 West Grant Line Road, approximately seven miles northeast of the project site (GWF 2008a, Section 5.16.4.5 and TFD 2009). The team consists of Hazmat technicians and has a response time of 14 minutes to the project site. In the event of a large spill, the County Hazmat team, which consists of units from several fire departments, would be called upon. The response time for the County's team could range between one and two hours. All TFD firefighters are trained as first responders to hazardous materials incidents and to the level of Emergency Medical Technician (EMT)-1. Five of TFD's seven engines are staffed with a trained paramedic (TFD 2009).

Worker Safety and Fire Protection Table 2
Equipment and Personnel at Tracy Fire Department*

TFD Station	Total Response Time**	Distance to GWF Tracy	EMS/HazMat Capability***
Station #94	3.5 mi	~1.8 miles	Yes/No
Station #97	10.5 min	~5 miles	Yes/No
Station #96	14 min	~7 miles	Yes/Yes

* Source: E-mail correspondence with Fire Captain Steve Hanlon (TFD 2009).
** Total response times are estimated from the moment a 911 call is made to arrival at the site and are dependent upon traffic conditions and other variables.
*** All personnel are trained to EMT-1 level and first responder for hazardous materials incidents.

In addition to construction and operations worker safety issues, the potential exists for exposure to contaminated soil during site preparation. The Phase I Environmental Site Assessment conducted for the original TPP site in 2001 concluded that no recognized environmental conditions were identified onsite or within the ASTM search distance of one mile (GWF 2008a, Section 5.14.3.1.1). To address the remote possibility that soil contamination would be encountered during construction of the GWF Tracy, proposed Conditions of Certification **WASTE-1** and **WASTE-2** require a registered professional engineer or geologist to be available during soil excavation and grading to ensure proper handling and disposal of contaminated soil. See the staff assessment section on **WASTE MANAGEMENT** for a more detailed analysis of this topic.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Two issues are assessed in WORKER SAFETY-FIRE PROTECTION:

1. The potential for impacts on the safety of workers during demolition, construction, and operations activities, and

2. Fire prevention/protection, emergency medical response, and hazardous materials spill response during demolition, construction, and operations.

Worker safety issues are thoroughly addressed by Cal/OSHA regulations. If all LORS are followed, workers will be adequately protected. Thus, the standard for staff's review and determination of significant impacts on workers is whether or not the applicant has demonstrated adequate knowledge about and dedication to implementing all pertinent and relevant Cal/OSHA standards.

Regarding fire prevention matters, staff reviews and evaluates the on-site fire-fighting systems proposed by the applicant and the time needed for off-site local fire departments to respond to a fire, medical, or hazardous material emergency at the proposed power plant site. If on-site systems do not follow established codes and industry standards, staff recommends additional measures. Staff reviews and evaluates the local fire department capabilities and response time in each area and interviews the local fire officials to determine if they feel adequately trained, manned, and equipped to respond to the needs of a power plant. Staff then determines if the presence of the power plant would cause a significant impact on a local fire department. If it does, staff will recommend that the applicant mitigate this impact by providing increased resources to the fire department.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Worker Safety

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the proposed GWF Tracy would 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 GWF Tracy to have well-defined policies and procedures, training, and hazard recognition and control at its 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.

A Safety and Health Program would 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 would be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

Construction Safety and Health Program

GWF Tracy encompasses construction and operation of components of a natural gas fired-facility. Workers would be exposed to hazards typical of construction and operation of a gas-fired simple cycle facility.

Construction Safety Orders are published at Title 8 California Code of Regulations sections 1502, et seq. These requirements are promulgated by Cal/OSHA and would be applicable to the construction phase of the project. The Construction Safety and Health Program would include the following:

- Construction Injury and Illness Prevention Program (8 Cal Code Regs. § 1509)
- Construction Fire Prevention Plan (8 Cal Code Regs. § 1920)
- Personal Protective Equipment Program (8 Cal Code Regs. §§ 1514 — 1522)
- Emergency Action Program and Plan

Additional programs under General Industry Safety Orders (8 Cal Code Regs. §§ 3200 to 6184), Electrical Safety Orders (8 Cal Code Regs. §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 Cal Code Regs. §§ 450 to 544) would include:

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

The Application for Certification (AFC) includes adequate outlines of each of the above programs (GWF 2008a, Section 5.16.4.3.1). Prior to the start of construction of GWF Tracy, detailed programs and plans would be provided to the California Energy Commission Compliance Project Manager (CPM) and to the TFD pursuant to the Condition of Certification **WORKER SAFETY-1**.

Operations and Maintenance Safety and Health Program

Prior to the start of operations at GWF Tracy, the Operations and Maintenance Safety and Health Program would be prepared. This operational safety program would include the following programs and plans:

- Injury and Illness Prevention Program (8 Cal Code Regs. § 3203)
- Fire Protection and Prevention Program (8 Cal Code Regs. § 3221)
- Personal Protective Equipment Program (8 Cal Code Regs. §§ 3401 to 3411)
- Emergency Action Plan (8 Cal Code Regs. § 3220)

In addition, the requirements under General Industry Safety Orders (8 Cal Code Regs. §§ 3200 to 6184), Electrical Safety Orders (8 Cal Code Regs. §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 Cal Code Regs. §§ 450 to 544) would be applicable to the project. Written safety programs for GWF Tracy, which the applicant would develop, would ensure compliance with the above-mentioned requirements.

The AFC includes adequate outlines of the Injury and Illness Prevention Program, Emergency Action Plan, Fire Prevention Program, and Personal Protective Equipment Program (GWF 2008a, Section 5.16.4.3.2). Prior to operation of GWF Tracy, all detailed programs and plans would be provided to the CPM and TFD pursuant to Condition of Certification **WORKER SAFETY-2**.

Safety and Health Program Elements

As mentioned above, the applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operations Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. Both safety and health programs would be comprised of six more specific programs and would require major items detailed in the following paragraphs.

Injury and Illness Prevention Program

The IIPP would include the following components as presented in the AFC (GWF 2008a, Section 5.16.4.3.2):

- Identity of person(s) with authority and responsibility for implementing the program;
- Safety and health policy of the plan;
- Definition of work rules and safe work practices for construction activities;
- System for ensuring that employees comply with safe and healthy work practices;
- System for facilitating employer-employee communications;

- Procedures for identifying and evaluating workplace hazards and developing necessary program(s);
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- Safety procedures; and
- Training and instruction.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (8 Cal Code Regs. § 3221). The AFC outlines a proposed Fire Protection and Prevention Program which is acceptable to staff (GWF 2008a, Section 5.16.4.3.2). The plan would accomplish the following:

- Determine general program requirements;
- Determine fire hazard inventory, including ignition sources and mitigation;
- Develop good housekeeping practices and proper materials storage;
- Establish employee alarm and/or communication system(s);
- Provide portable fire extinguishers at appropriate site locations;
- Locate fixed fire-fighting equipment in suitable areas;
- Specify fire control requirements and procedures;
- Establish proper flammable and combustible liquid storage facilities;
- Identify the location and use of flammable and combustible liquids;
- Provide proper dispensing and determine disposal requirements for flammable liquids;
- Establish and determine training and instruction requirements and programs; and
- Identify personnel to contact for information on plan contents.

Staff proposes that the applicant submit a final Fire Prevention Plan to the CPM for review and approval and to the TFD for review and comment to satisfy proposed Conditions of Certification **WORKER SAFETY-1** and **WORKER SAFETY-2**.

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are present that, due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation, or physical contact (8 Cal Code Regs. §§ 3380 to 3400). The GWF Tracy operational environment would require PPE.

All safety equipment must meet National Institute of Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and would carry markings,

numbers, or certificates of approval. Respirators must meet NIOSH and Cal/OSHA standards. Each employee must be provided with the following information pertaining to the protective clothing and equipment:

- Proper use, maintenance, and storage;
- When to use the protective clothing and equipment;
- Benefits and limitations; and
- When and how to replace the protective clothing and equipment.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provides employees with the information and training necessary to protect them from potential workplace hazards.

Emergency Action Plan

California regulations require an Emergency Action Plan (8 Cal Code Regs. § 3220). The AFC contains a satisfactory outline for an emergency action plan (GWF 2008a, Section 5.16.4.3.2).

The outline lists plans to accomplish the following:

- Establish emergency escape procedures and emergency escape route for the facility;
- Determine procedures to be followed by employees who remain to operate critical plant operations before they evacuate;
- Provide procedures to account for all employees and visitors after emergency evacuation of the plant has been completed;
- Specify rescue and medical duties for assigned employees;
- Identify fire and emergency reporting procedures to regulatory agencies;
- Develop alarm and communication system for the facility;
- Establish a list of personnel to contact for information on the plan contents; and
- Determine and establish training and instruction requirements and programs.

Written Safety Program

In addition to the specific plans listed above, additional LORS called *safe work practices* apply to the project. Both the Construction and the Operations Safety Programs would address safe work practices under a variety of programs. The components of these programs include, but are not limited to, the programs found under the heading “Construction Safety and Health Program” in this WORKER SAFETY AND FIRE PROTECTION section.

Safety Training Programs

Employees would be trained in the safe work practices described in the above-referenced safety programs.

Additional Mitigation Measures

Protecting construction workers from injury and disease is among the greatest challenges in occupational safety and health. The following facts are reported by the National Institute for Occupational Safety and Health (NIOSH):

- More than seven million persons work in the construction industry, representing 6% of the labor force. Approximately 1.5 million of these workers are self-employed.
- Of approximately 600,000 construction companies, 90% employ fewer than 20 workers. Few have formal safety and health programs.
- From 1980 to 1993, an average of 1,079 construction workers were killed on the job each year—more fatal injuries than in any other industry.
- Falls caused 3,859 construction worker fatalities (25.6%) between 1980 and 1993.
- Construction injuries account for 15% of workers' compensation costs.
- Assuring safety and health in construction is complex, involving short-term work sites, changing hazards, and multiple operations and crews working in close proximity.
- In 1990, Congress directed NIOSH to undertake research and training to reduce diseases and injuries among construction workers in the United States. Under this mandate, NIOSH funds both intramural and extramural research projects.

The hazards associated with the construction industry are thus well documented. These hazards increase in complexity in the multi-employer worksites typical of large, complex, industrial-type projects such as the construction of gas-fired power plants. In order to reduce and/or eliminate these hazards, it has become standard industry practice to hire a Construction Safety Supervisor to ensure a safe and healthful environment for all personnel. That this standard practice has reduced and/or eliminated hazards has been evident in the audits staff recently conducted of power plants under construction. The federal Occupational Safety and Health Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as Construction Safety Supervisors, Construction Health and Safety Officers, and other professional designations. The goal of these partnerships is to encourage construction subcontractors in four areas:

- To improve their safety and health performance;
- To assist them in striving for the elimination of the four hazards (falls, electrical, caught in/between and struck-by hazards), which account for the majority of fatalities and injuries in this industry and have been the focus of targeted OSHA inspections;
- To prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and
- To recognize those subcontractors with exemplary safety and health programs.

To date, there are no OSHA or Cal/OSHA requirements that an employer hire or provide for a Construction Safety Officer. OSHA and Cal/OSHA regulations do, however, require that safety be provided by an employer and the term *Competent Person* is used in many OSHA and Cal/OSHA standards, documents, and directives. A

Competent Person is usually defined by OSHA as an individual who, by way of training and/or experience, is knowledgeable of standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer, and has authority to take appropriate action. Therefore, in order to meet the intent of the OSHA standard to provide for a safe workplace during power plant construction, staff proposes Condition of Certification **WORKER SAFETY-3,** which would require the applicant/project owner to designate and provide for a power plant site Construction Safety Supervisor.

As discussed above, the hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer worksites typical of large, complex, industrial-type projects such as the construction of gas-fired power plants.

Accidents, fires, and a worker death have occurred at Energy Commission-certified power plants in the recent past due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. Safety problems have been documented by Energy Commission staff in safety audits conducted in 2005 at several power plants under construction. The findings of the audit staff include, but are not limited to, such safety oversights as:

- Lack of posted confined space warning placards/signs;
- Confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;
- Confusing and/or inappropriate procedures for handing over lockout/tagout and confined space permits from the construction team to commissioning team and then to operations;
- Dangerous placement of hydraulic elevated platforms under each other;
- Inappropriate placement of fire extinguishers near hotwork;
- Dangerous placement of numerous power cords in standing water on the site, thus increasing the risk of electrocution;
- Construction of an unsafe aqueous ammonia unloading pad;
- Inappropriate and unsecure placement of above-ground natural gas pipelines inside the facility but too close to the perimeter fence; and
- Lack of adequate employee- or contractor-written training programs addressing proper procedures to follow in the event of finding suspicious packages or objects either on or off site.

In order to reduce and/or eliminate these hazards, it is necessary for the Energy Commission to have a professional Safety Monitor on site to track compliance with Cal/OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand-over to operational status. These requirements are outlined in Condition of Certification **WORKER SAFETY-4**. A Safety Monitor, hired by the project owner, yet reporting to the Chief Building Official (CBO) and CPM, will serve as an on-site reviewer to ensure that safety procedures and practices are fully

implemented at all power plants certified by the Energy Commission. During the audits conducted by staff, most site safety professionals welcomed the audit team and actively engaged it in questions about the team's findings and recommendations. These safety professionals recognized that safety requires continuous vigilance and that the presence of an independent audit team provided a fresh perspective of the site.

Fire Hazards

During construction and operation of the proposed GWF Tracy project, there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas, hydraulic fluid, mineral oil, flammable liquids explosions, and over-heated equipment, may cause small fires. Major structural fires in areas without automatic fire detection and suppression systems are unlikely to develop at power plants. Fires and explosions of natural gas or other flammable gasses or liquids are rare. Compliance with all LORS would be adequate to assure protection from all fire hazards.

Staff reviewed the information provided in the AFC and spoke to representatives of the Tracy Fire Department (TFD) to determine if available fire protection services and equipment would adequately protect workers and to determine the project's impact on fire protection services in the area. The project will rely on both on-site fire protection systems and local fire protection services. The on-site 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 provided by the TFD (TFD 2009).

Construction

During construction, the existing fire suppression system installed at the TPP site would be sufficient to ensure adequate fire protection. The TFD would be available to provide fire protection backup for larger fires.

Operation

The information in the AFC indicates that the project intends to meet the fire protection and suppression requirements of the California Fire Code, all applicable recommended NFPA standards (including Standard 850 addressing fire protection at electric generating plants), and all Cal/OSHA requirements with one exception (see below). Fire suppression elements in the proposed plant would include both fixed and portable fire extinguishing systems. The existing fire protection systems at the TPP site would be modified and upgraded to include the expansion structures. The fire water would be supplied by the existing firewater tank which would be modified to increase its capacity from 250,000 gallons to 300,000 gallons. Also, a new electrical fire water pump and a diesel-driven fire pump would be installed to accommodate the plant expansion (GWF 2008a, Section 2.2.11).

Fire hydrants would be installed per NFPA requirements and a fixed sprinkler system would be installed to protect the STG unit and associated lube oil system. Fire detection sensors would be installed throughout the system. In addition to the fixed fire protection system, appropriate class of service portable extinguishers would be located at the administrative building, other buildings, and throughout the facility at code-approved

intervals (GWF 2008a, Section 2.2.11 & 2.3.2.1.1). These systems are standard requirements by the NFPA, and the Uniform Fire Code (UFC) and staff has determined that they will ensure adequate fire protection.

The applicant would be required by Conditions of Certification **WORKER SAFETY-1** and**-2** to provide the final Fire Protection and Prevention Program to staff and to the TFD prior to construction and operation of the project to confirm the adequacy of the proposed fire protection measures.

The one exception mentioned above pertains to fire department access to the site. Both the California Fire Code (24 CCR Part 9, chapter 5, section 503.1.2) and the Uniform Fire Code (sections 901 and 902) require that access to the site be reviewed and approved by the fire department. All power plants licensed by the Energy Commission have more than one access point to the power plant site. This is sound fire safety procedure and allows for fire department vehicles and personal to access the site should the main gate be blocked. It appears from the AFC that during construction, the site will have two access points: the main gate on the west side and a construction lay down area access gate on the north side (AFC Figure 1.1-4). However, it is not apparent from plot-plans that the project will maintain these two access points during operations and the AFC makes no mention of a secondary access point through the perimeter fence. A second access point is necessary to ensure fire department access and this access point can be restricted to emergency use only. If possible and in consultation with the Tracy Fire Department, it should be equipped with the Fire Department's remote keyless entry system (for example, the Opticom System). Therefore, in order to comply with the requirements of LORS, staff proposes a Condition of Certification **WORKER SAFETY-6** that would require the project owner to identify and provide a second access point to the site for emergency vehicles and equip this secondary gate with a method for fire department personnel to open the gate.

Emergency Medical Services Response

Staff conducted a statewide survey to determine the frequency of Emergency Medical Services (EMS) response and off-site fire-fighter response for natural gas-fired power plants in California (Greenberg 2003). The purpose of the analysis was to determine what impact, if any, power plants may have on local emergency services. Staff has concluded that incidents at power plants that require fire or EMS response are infrequent and represent an insignificant impact on the local fire departments, except for rare instances where a rural fire department has mostly volunteer fire-fighting staff. However, staff has determined that the potential for both work-related and non-work-related heart attacks exists at power plants. In fact, staff's research on the frequency of EMS response to gas-fired power plants shows that many of the responses for cardiac emergencies involved non-work-related incidences, including those involving visitors. The need for prompt response within a few minutes is well documented in the medical literature. Staff believes that the quickest medical intervention can only be achieved with the use of an on-site automatic external defibrillator (AED); the response from an off-site provider would take longer regardless of the provider location. This fact is also well documented and serves as the basis for many private and public locations (e.g., airports, factories, government buildings) maintaining on-site cardiac defibrillation devices. Therefore, staff concludes that, with the advent of modern cost-effective

cardiac defibrillation devices, it is proper in a power plant environment to maintain such a device on site in order to treat cardiac arrythmias resulting from industrial accidents or other non-work related causes.

Since the AFC is slient on the presence of an AED at the TPP site, and staff did not see an AED during the March 2005 audit of the TPP, staff proposes Condition of Certification **WORKER SAFETY-5,** which would require that this portable AED be located on site, that all power plant employees on site during operations be trained in its use, and that a representative number of workers on site during construction and commissioning also be trained in its use.

CUMULATIVE IMPACTS AND MITIGATION

Staff reviewed the potential for the construction and operation of the GWF Tracy project combined with existing industrial facilities and expected new facilities to result in impacts on the fire and emergency service capabilities of the TFD. The TFD indicated that the proposed expansion has the potential to create an impact on their ability to adequately respond to all incidents in their jurisdiction. The potential increase in calls to the TFD involving fires, medical emergencies, rescue, and hazardous materials spills may impact their resources according to their spokesman (TFD 2009).

Staff disagrees with this position. Modern fire detection and suppression systems will be installed at this power plant and a staff survey (Greenberg 2003) of six California city fire departments, four power plant owners, the U.S. Department of Labor Occupational Safety and Health Administration (U.S. OHSA), the California Occupational Safety and Health Administration (Cal-OSHA), the National Fire Protection Association (NFPA), the Federal Bureau of Labor Statistics, the National Response Center (NRC), the California Office of Emergency Services, and the Office of the State of California Fire Marshall supports the conclusion that the frequency of off-site fire response is minimal. Given the fact that the GWF Tracy represents a relatively small expansion at an existing plant, staff finds that this project will not present any significant incremental individual or cumulative burden on the Tracy Fire Department's ability to respond to a fire, hazardous material release, or medical emergency.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments have been received relating to worker safety or fire protection issues.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Based upon the above information, staff concludes that construction and operation of the GWF Tracy project would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS) regarding long-term and short-term project impacts in the areas of worker safety and fire protection.

CONCLUSIONS

Staff concludes that if the applicant for the proposed GWF Tracy project provides a Project Construction Safety and Health Program and a Project Operations and Maintenance Safety and Health Program as required by Conditions of Certification **WORKER SAFETY-1**, and **-2** and fulfils the requirements of Condition of Certification **WORKER SAFETY-3** through **-6**, the project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. Staff also concludes that the proposed project would not have significant impacts on local fire protection services.

PROPOSED CONDITIONS OF CERTIFICATION

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

- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program;
- A Construction Emergency Action Plan; and
- A Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring Program, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable safety orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the Tracy Fire Department for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program.

At least 30 days prior to the start of construction, the project owner shall provide a copy of a letter to the CPM from the Tracy Fire Department stating the fire department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan;
- An Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Prevention Plan (8 Cal Code Regs. § 3221); and

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

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the CPM for review and comment concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the Tracy Fire Department for review and comment.

Verification: At least 30 days prior to the start of commissioning ("first fire"), the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program.

At least 30 days prior to the start of construction, the project owner shall provide a copy of a letter to the CPM from the Tracy Fire Department stating the fire department's comments on the Operations Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards; is capable of identifying workplace hazards relating to the construction activities; and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA and federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations and emergency response reports for injuries and inform the CPM of safety-related incidents; and
- Assure that all the plans identified in Conditions of Certification **WORKER SAFETY-1** and **-2** are implemented.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement CSS shall be submitted to the CPM within one business day.

In the Monthly Compliance Report, the CSS shall submit a monthly safety inspection report to include:

- Record of all employees trained for that month (all records shall be kept on site for the duration of the project);

- Summary report of safety management actions and safety-related incidents that occurred during the month;
- Report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- Report of accidents and injuries that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO and will be responsible for verifying that the Construction Safety Supervisor, as required in Condition of Certification Worker Safety-3, and for implementing all appropriate Cal/OSHA and Energy Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: Prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that a portable automatic external defibrillator (AED) is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During construction and commissioning, the following persons shall be trained in its use and shall be on site whenever the workers that they supervise are on site: the Construction Project Manager or delegate, the Construction Safety Supervisor or delegate, and all shift foremen. During operations, all power plant employees shall be trained in its use. The training program shall be submitted to the CPM for review and approval.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM for review and approval proof that a portable automatic external defibrillator (AED) exists on site and a copy of the training and maintenance program.

WORKER SAFETY-6 The project owner shall identify and provide a second access point for emergency personnel to enter the site. This access point and the method of gate operation shall be submitted to the Tracy Fire Department for review and comment and to the CPM for review and approval.

Verification: At least 60 days prior to the start of commissioning ("first fire"), the project owner shall submit to the Tracy Fire Department and the CPM preliminary plans showing the location of a second access point to the site and a description of how the gate will be opened by the fire department.

At least thirty (30) days prior to the start of commercial operations, the project owner shall submit final plans to the CPM review and approval. The final plan submittal shall also include a letter containing comments from the Tracy Fire Department or a statement that no comments were received.

REFERENCES

California Fire Code 2007. 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.

Greenberg, A. and S. Greenberg 2003. Off-Site Emergency Response to Power Plants in California, Prepared for the California Energy Commission. August.

GWF 2008a – GWF Energy LLC/D. Wheeler (tn: 47105). Application for Certification for GWF Tracy Combined Cycle Power Plant Project, dated 7/10/2008. Submitted to CEC/Docket Unit on 7/18/2008.

TFD 2009 –. E-mail correspondence with Tracy Fire Department Captain Steve Hanlon, January 9.

Uniform Fire Code 1997, 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.

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

ENGINEERING ASSESSMENT

FACILITY DESIGN

Testimony of Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The California Energy Commission staff concludes that the design, construction, and eventual closure of the GWF Tracy Combined Cycle Power Plant project and its linear facilities would likely comply with applicable engineering laws, ordinances, regulations, and standards. The proposed conditions of certification would ensure compliance with these laws, ordinances, regulations, and standards.

INTRODUCTION

Facility design encompasses the civil, structural, mechanical, and electrical engineering design of the GWF Tracy Combined Cycle Power Plant (GWF Tracy). The purpose of this analysis is to:

- Verify that the laws, ordinances, regulations, and standards (LORS) that apply to the engineering design and construction of the project have been identified;
- Verify that both the project and its ancillary facilities are sufficiently described, including proposed design criteria and analysis methods, in order to provide reasonable assurance that the project would be designed and constructed in accordance with all applicable engineering LORS and in a manner that ensures the public health and safety;
- Determine whether special design features should be considered during final design to address conditions unique to the site that could influence public health and safety; and
- Describe the design review and construction inspection process and establish the conditions of certification used to monitor and ensure compliance with the engineering LORS, in addition to any special design requirements.

Subjects discussed in this analysis include:

- Identification of the engineering LORS that apply to facility design;
- Evaluation of the applicant's proposed design criteria, including identification of criteria essential to public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) necessary for compliance with applicable engineering LORS; and
- Conditions of certification proposed by staff to ensure that the project would be designed and constructed to ensure public health and safety and comply with all applicable engineering LORS.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical, and electrical) are described in the AFC (GWF 2008a, Appendix 2A). Key LORS are listed in **Facility Design Table 1,** below:

Facility Design Table 1
Key Engineering Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards
State	2007 California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)
Local	San Joaquin County regulations and ordinances
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

SETTING

GWF Tracy would be built within a 16.4-acre portion of the existing GWF's 40-acre parcel in an unincorporated portion of San Joaquin County located southwest of Tracy, California. The site lies in Seismic Zone 4. For more information on the site and its related project description, please see the **PROJECT DESCRIPTION** section of this document. Additional engineering design details are contained in the AFC, Appendix 2A (GWF 2008a).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The purpose of this analysis is to ensure that GWF Tracy would be built to applicable engineering codes and ensure public health and life safety. This analysis further verifies that applicable engineering LORS have been identified and that the project and its ancillary facilities have been described in adequate detail. It also evaluates the applicant's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements. These conditions allow both the California Energy Commission (Energy Commission) compliance project manager (CPM) and the applicant to adopt a compliance monitoring scheme that would verify compliance with these LORS.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access, along with the criteria for design and construction of linear support facilities (e.g., natural gas and electric transmission

interconnections). The applicant proposes to use accepted industry standards, design practices, and construction methods for preparation and development of the site (see GWF 2008a, Appendix 2A, for a representative list of applicable industry standards). Staff concludes that this 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 that compliance.

MAJOR STRUCTURES, SYSTEMS, AND EQUIPMENT

Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production; are costly or time-consuming to repair or replace; are used for the storage, containment, or handling of hazardous or toxic materials; or that could become potential health and safety hazards if not constructed according to applicable engineering LORS. Major structures and equipment requirements are identified in the proposed Condition of Certification **GEN-2, Facility Design Table 2**. Typically, **Facility Design Table 2** in Condition of Certification **GEN-2** lists the major structures and equipment identified in the AFC and other project related information available before project licensing; this list is based on the preliminary design of the project. The master drawing and master specifications lists described in Condition of Certification **GEN-2**, however, include the project-related documents based on the project's detailed design and may include additional documents for structures and equipment not identified in **Facility Design Table 2**. (Detailed project design typically occurs after project licensing and is not available at this time.)

GWF Tracy would be designed and constructed in compliance with the 2007 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 when the design and construction of the project actually begins. If the initial designs are submitted to the chief building official (CBO) for review and approval after the update to the 2007 CBSC takes effect, the 2007 CBSC provisions would be replaced with the updated 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 would be analyzed according to their appropriate lateral force procedure, staff has included Condition of Certification **STRUC-1**, which, in part, requires the project CBO's review and approval of the owner's proposed lateral force procedures before construction begins.

PROJECT QUALITY PROCEDURES

The project's AFC (GWF 2008a, § 2.4.5) describes a quality program intended to inspire confidence that its systems and components would be designed, fabricated, stored, transported, installed, and tested in accordance with all appropriate power plant technical codes and standards. Compliance with design requirements would be verified

through specific inspections and audits. Implementation of this quality assurance/quality control (QA/QC) program would ensure that GWF Tracy would actually be designed, procured, fabricated, and installed as described in this analysis.

COMPLIANCE MONITORING

Under section 104.2 of the CBC, the CBO is authorized and directed to enforce all provisions of the CBC. The Energy Commission itself serves as the building official and has the responsibility to enforce the code for all of the energy facilities it certifies. In addition, the Energy Commission has the authority to interpret the CBC and adopt and enforce both rules and supplemental regulations that clarify application of the CBC's provisions.

The Energy Commission's design review and construction inspection process conforms to CBC requirements and ensures 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 perform design review and construction inspections and act as delegate CBOs on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to provide technical expertise that is not available from the local official alone. The applicant, through permit fees provided by the CBC, pays the cost of these reviews and inspections. Although building permits are not required for this project, due to the Energy Commission's exclusive authority, the applicant pays in-lieu CBC permit fees to cover the costs of these reviews and inspections.

Upon project certification, Energy Commission engineering and compliance staff would invite San Joaquin County or a third-party engineering consultant to act as CBO for this project. When an entity has been assigned CBO duties, Energy Commission staff would complete a memorandum of understanding (MOU) with that entity to outline its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed conditions of certification for GWF Tracy to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities, and qualifications of the engineers who would design and build the proposed project (Conditions of Certification **GEN-1** through **GEN-8**). These engineers must be registered in California and sign and stamp every submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that every element of the project's construction subject to CBO review and approval be approved by the CBO before it is performed. They also require that qualified special inspectors perform or oversee special inspections required by all applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written so that no element of the construction of permanent facilities subject to CBO review and approval, which could be difficult to reverse or correct, would be allowed to proceed without prior CBO approval. Elements of construction that would not be difficult to reverse would be allowed to proceed without prior approval of the plans. The applicant bears the responsibility to fully modify construction elements to comply with all design changes resulting from the CBO's subsequent plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service (decommissioning) when it reaches the end of its useful life ranges from “mothballing” (shutting down normal operations, but keeping a facility in good repair so that it can be quickly restored to working order if needed) to the removal of all equipment and appurtenant facilities and restoration of the site to pre-construction condition or other usable alternative. Future conditions that could affect decommissioning are largely unknown at this time.

In order to ensure that decommissioning would be completed in a manner that is environmentally sound, safe, and protects the public health and safety, the applicant would be required to submit a decommissioning plan to the Energy Commission for review and approval before the project’s decommissioning begins. The plan would be required to include a discussion of:

- Proposed decommissioning activities for the project and all appurtenant facilities that were constructed as part of the project;
- All applicable LORS, local/regional plans, and proof of adherence to those 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.

Satisfying the above requirements should serve as adequate protection, even in the unlikely event that the project is abandoned. Staff has proposed general conditions (see **GENERAL CONDITIONS**) to ensure that these measures would be included in the Facility Closure Plan.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments have been received relating to facility design issues.

CONCLUSIONS AND RECOMMENDATIONS

1. The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents directly apply 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 would likely comply with applicable engineering LORS.

3. The proposed conditions of certification would ensure that GWF Tracy is designed and constructed in accordance with applicable engineering LORS. This would be accomplished through design review, plan checking, and field inspections that would be performed by the CBO or other Energy Commission delegate. Staff would audit the CBO to ensure satisfactory performance.

4. Although future conditions that could affect decommissioning are largely unknown at this time, it can reasonably be concluded that submission and approval of a decommissioning plan prior to closure, as required in the **GENERAL CONDITIONS** portion of this document, would ensure that decommissioning procedures would comply with all applicable engineering LORS.

Energy Commission staff recommends that:

1. The proposed conditions of certification be adopted to ensure that the project would be designed and constructed in a manner that protects the public health and safety and complies with all applicable engineering LORS;

2. The project be designed and built to comply with 2007 CBSC standards (or successor standards, if in effect when initial project engineering designs are submitted for review); and

3. The CBO review the final designs, check plans, and perform field inspections during all phases of construction. Energy Commission staff would 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 2007 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 Chief Building Official (CBO) for review and approval. The CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days prior to the time initial design plans are submitted to the CBO. The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility. (See the **TRANSMISSION SYSTEM ENGINEERING** section of this document for conditions of certification for all transmission facilities [lines, switchyards, switching stations, and substations].)

In the event that the initial engineering designs are submitted to the CBO after the successor to the 2007 CBSC goes into effect, the 2007 CBSC provisions 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 requirements other than the general requirements or those in effect at the time of project certification, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied shall comply with the codes and requirements listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit a statement of verification to the Compliance Project Manager (CPM), 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 a copy of the certificate of occupancy to the CPM within 30 days of receipt from the CBO.

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the codes identified in **GEN-1**. The CPM shall then determine if the CBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, along with the master drawing and master specifications lists. 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 upon request.

Verification: At least 60 days prior to the start of rough grading (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit the schedule of facility design, master drawing list, and master specifications list of documents to the CBO and CPM, prior to submitting the initial engineering designs 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 2** 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.

Facility Design Table 2
Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Steam Turbine (ST) Foundation and Connections	1
ST Generator Foundation and Connections	1
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	2
HRSG Stack Structure, Foundation and Connections	2
SCR Skid Structure, Foundation and Connections	2
Duct Burner Skid Structure, Foundation and Connections	2
Boiler Feed Pump Foundation and Connections	4
Boiler Blowdown Tank Foundation and Connections	2
CEMS Structure, Foundation and Connections	2
Generator Rotor Removal	1
ST Lube Oil Reservoir Foundation and Connections	1
Gland Condenser Foundation and Connections	1
ST Step-up Transformer Foundation and Connections	1
ST Auxiliary Transformer Foundation and Connections	1
Water Treatment Building Structure, Foundation and Connections	1
Demineralized Water Tank Foundation and Connections	1
Steam Duct Structure, Foundation and Connections	1
Air-Cooled Condenser Structure, Foundation and Connections	1
Auxiliary Boiler & Stack Structure, Foundation and Connections	1
D.I. Trailer Structure, Foundation and Connections	2
Service/Fire Water Storage Tank Foundation and Connections	1
Fire Water Storage Tank Foundation and Connections	1
ST Closed Cycle Cooling Unit Structure, Foundation and Connections	1
Storm Water Retention Basin Relocation	1
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping and Pipe Racks	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
Switchyard, Buses, and Towers	1 Lot
Electrical Duct Banks and Breakers	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, based on a reasonable fee schedule (to be negotiated between the project owner and the CBO). These fees shall be consistent with the fees listed in the 2007 CBC, adjusted for inflation and other appropriate adjustments; based on the value of the facilities reviewed; based on hourly rates; or as otherwise agreed upon 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 applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California-registered architect or structural/civil engineer as the resident engineer (RE) in charge of the project. (See the **TRANSMISSION SYSTEM ENGINEERING** section of this document for conditions of certification for all transmission facilities [lines, switchyards, switching stations, and substations].)

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 that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;

2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;

3. Prepare documents to initiate changes in approved drawings and specifications when directed by the project owner or as required by the conditions of the project;

4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and other required documents;

5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, 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 and the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications.

The RE shall have the authority to halt construction and require changes or remedial work if the work does not meet 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 prior to the start of rough grading (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit the resume and registration number of the RE and any other delegated engineers assigned to the project to the CBO for review and approval. 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) is/are subsequently reassigned or replaced, the project owner shall have five days 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 civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and 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: 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; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California). (See the **TRANSMISSION SYSTEM ENGINEERING** section of this document for conditions of certification for all transmission facilities [lines, switchyards, switching stations, and substations].)

The project owner shall submit the names, qualifications, and registration numbers of all responsible engineers assigned to the project to the CBO for review and approval. If any designated responsible engineer 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.

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 (e.g., proposed earthwork, civil structures, power plant structures, equipment support) of the project. 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.

A. The civil engineer shall:

1. Review the foundation investigations, geotechnical, and/or soils reports prepared by the soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering;

2. Design (or be responsible for the design of), 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, this includes: 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 to the construction procedures and in the design of the civil works facilities.

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, geotechnical, and/or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement, or collapse when saturated under load;

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2007 CBC. Depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both; and

4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a 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 2007 CBC. Depending on the site conditions, this may be the responsibility of either the soils engineer or the 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, sign, and stamp a statement with each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all mechanical engineering design requirements set forth in the Energy Commission's decision and conditions of certification.

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 prior to the start of rough grading (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer, and engineering geologist assigned to the project to the CBO for review and approval.

At least 30 days prior to the start of construction (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project to the CBO for review and approval,.

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(s), the project owner shall assign qualified and certified special inspector(s) to the project, who shall be responsible for the special inspections required. (See the **TRANSMISSION SYSTEM ENGINEERING** section of this document for conditions of certification for all transmission facilities [lines, switchyards, switching stations, and substations].)

A weld inspector, certified by the American Welding Society (AWS) and/or American Society of Mechanical Engineers (ASME), shall inspect welding performed on site that requires special inspection (including structural, piping, tanks, and pressure vessels).

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. If uncorrected, discrepancies shall be brought to the immediate attention of the CBO and the CPM for corrective action; and

4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC or other applicable standard.

Verification: At least 15 days prior to the start of an activity requiring special inspection (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit 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 in **GEN-6** to the CBO for review and approval, with a copy to the CPM. The project owner shall also submit a copy of the CBO's approval of the qualifications of all special inspectors to the CPM in the next monthly compliance report.

If a 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 identify the required corrective actions. 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, 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 the 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. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or another accessible location during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit: (1) a written notice that the completed work is ready for final inspection and (2) a signed statement that the work conforms to the final approved plans to the CBO, with a copy to the CPM, in the next monthly compliance report. After storing the final approved engineering plans, specifications, and calculations required by **GEN-8**, the project owner shall submit a letter to the CPM stating that the above documents have been stored and identifying the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide three sets of electronic copies of the above documents to the CBO, at the project owner's expense. These copies are to be provided in the form of "read only" files, in Adobe.pdf 6.0 format, with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 The project owner shall submit the following to the CBO for review and approval:

1. Design of the proposed drainage structures and grading plan;
2. Erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils, geotechnical, and/or foundation investigations reports required by the 2007 CBC.

Verification: At least 15 days prior to the start of site grading (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit the

documents required by **CIVIL-1** to the CBO for design review and approval. The project owner shall submit a written statement certifying that the documents have been approved by the CBO in the next monthly compliance report following the CBO's approval.

CIVIL-2 The resident engineer shall have the authority to stop all earthwork and construction in the affected area(s) in the event 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 the newly identified soil or geologic conditions. The project owner shall obtain CBO approval before resuming earthwork and construction in the affected area.

Verification: The project owner shall notify the CPM within 24 hours of earthwork and construction stoppage as a result of unforeseen adverse geologic/soil conditions. The project owner shall provide a copy of the CBO's approval to the CPM within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas.

CIVIL-3 The project owner shall perform inspections in accordance with the 2007 CBC and other applicable LORS. All plant site-grading operations, for which a grading plan 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. 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 a non-conformance report (NCR) and the proposed corrective action to the CBO and the CPM 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 the erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage work (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit the final grading plans (including final changes) to the CBO for review and approval, along with 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. A copy of the transmittal letter shall also be sent concurrently 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 for any major structure or component listed in **GEN-2, Facility Design Table 2**, the project owner shall submit the proposed lateral force procedures for project structures and the applicable designs, plans, and drawings for project structures to the CBO for design review and approval. Proposed lateral force procedures, designs, plans, and drawings shall be provided for the following items (from **Facility Design Table 2** above):

1. Major project structures;

2. Major foundations, equipment supports, and anchorage; and

3. Large field-fabricated tanks.

Construction of any structure or component shall not begin 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 of lateral force procedures proposed for project structures from the CBO;

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 (e.g. highest loads or lowest allowable stresses). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;

3. Submit the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures to the CBO prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;

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; and

5. Submit the responsible design engineer’s signed statement to the CBO, certifying that the final design plans conform to applicable LORS.

Verification: At least 60 days prior to the start of any increment of construction (or within the project owner- and CBO-approved alternative time frame) for any structure or

component listed in **GEN-2**, **Facility Design Table 2,** the project owner shall submit the above final design plans, specifications and calculations to the CBO, with a copy of the transmittal letter to the CPM.

The project owner shall submit a copy of the statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS to the CPM in the next monthly compliance report.

STRUC-2 The project owner shall submit the required number of sets of the following documents to the CBO, 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, in accordance with the 2007 CBC or other applicable LORS.

Verification: The project owner shall, within five days, prepare and submit an NCR to the CBO, describing the nature of discrepancies discovered in any of the data required in **STRUC-2** and the proposed corrective action, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section.

The project owner shall transmit a copy of the CBO's approval or disapproval of the proposed corrective action 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 to obtain the CBO's approval.

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.

STRUC-3 The project owner shall submit design changes to the final plans, required by the 2007 CBC, to the CBO, 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: The project owner shall notify the CBO of the intended filing of design changes, on a schedule acceptable to the CBO, 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 the 2007 CBC shall, at a minimum, be designed to comply with the applicable chapter of the code.

Verification: At least 30 days prior to the start of installation of tanks or vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2007 CBC (or within the project owner- and CBO-approved alternate time frame), the project owner shall submit final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification, to the CBO for design review and approval.

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 the proposed final design, specifications, and calculations for each plant major piping and plumbing system listed in **GEN-2**, **Facility Design Table 2**, for CBO design review and approval, along with applicable quality assurance/quality control (QA/QC) procedures. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations, and industry standards. These industry LORS may include, but are not 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
- San Joaquin County codes.

The CBO may deputize inspectors to carry out the functions of the applicable code enforcement agency.

Verification: At least 30 days prior to the start of any increment of major piping or plumbing construction listed in **GEN-2, Facility Design Table 2** (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit the final plans, specifications, and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, to the CBO for design review and approval and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

The project owner shall provide a copy of the transmittal letter conveying the CBO's inspection approvals to the CPM in the monthly compliance report following completion of any inspection.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit, prior to operation, the code certification papers and other documents required by applicable LORS to the CBO and California Occupational Safety and Health Administration (Cal/OSHA). Upon completion of the installation of any pressure vessel, the project owner shall request inspection of that installation by the CBO and/or Cal/OSHA.

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 certifying 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 prior to the start of on-site fabrication or installation of any pressure vessel (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit the documents required in **MECH-2**, including a copy of the signed and stamped engineer's certification, to the CBO for design review and approval, with a copy of the transmittal letter to the CPM.

The project owner shall also submit a copy of the transmittal letter conveying the CBO's and/or Cal/OSHA inspection approvals to the CPM in the monthly compliance report following completion of any inspection.

MECH-3 The project owner shall submit the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system to the CBO for design review and approval. 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 that 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.

Verification: At least 30 days prior to the start of construction of any HVAC or refrigeration system (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit 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 to the CBO, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 Volts or higher (see a representative list, 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 the proposed final design, specifications, and calculations to the CBO for design review and approval. 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. (See the **TRANSMISSION SYSTEM ENGINEERING** section of this document for conditions of certification for all transmission facilities [lines, switchyards, switching stations, and substations].)

A. Final plant design plans shall 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 must 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 and conditions of certification.

Verification: At least 30 days prior to the start of each increment of electrical construction (or within the project owner- and CBO-approved alternative time frame), the project owner shall submit the documents required in **ELEC-1** to the CBO for design review and approval. The project owner shall include, in this submittal, a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

REFERENCES

GWF 2008a — GWF Energy LLC/D. Wheeler (tn: 47105). Application for Certification for GWF Tracy Combined Cycle Power Plant Project, dated 7/10/2008. Submitted to California Energy Commission Docket Unit on 7/18/2008.

GEOLOGY AND PALEONTOLOGY

Testimony of Patrick A. Pilling, Ph.D., P.E, G.E.

SUMMARY OF CONCLUSIONS

The proposed GWF Tracy Combined Cycle Power Plant (GWF Tracy) site is located in an active geologic area of the Great Valley physiographic province along the boundary between the Coast Ranges and the Great Valley physiographic provinces. The project site is located immediately southwest of Tracy, San Joaquin County, California, and near the western edge of the San Joaquin Valley. Because of its geologic setting, the site could be subjected to intense levels of earthquake-related ground shaking. In addition, the site is underlain by expansive clay soils and fine grain soils that could exhibit excessive consolidation when surcharged by heavily loaded structures. The impacts to the project from strong ground shaking, expansive soils, and excessive consolidation can be effectively mitigated, however, through structural designs as required by the 2007 California Building Code (CBC). The design-level geotechnical investigation required for the project by the CBC and proposed **FACILITY DESIGN** Conditions of Certification **GEN-1**, **GEN-5,** and **CIVIL-1** require standard engineering design recommendations for mitigation of strong ground shaking, expansive clay soils, and excessive settlement due to compressible soils.

There are no known viable geologic or mineralogical resources at the proposed GWF Tracy project site. Paleontological resources have been documented in older Quaternary sediments within three miles of the site, and paleontological resources were encountered during construction of the Tracy Peaker Project (TPP) (Lawler Associates Geoscience 2003). Potential impacts to paleontological resources due to construction activities would be mitigated through worker training and monitoring by qualified paleontologists, as required by Conditions of Certification **PAL-1** through **PAL-7**.

Based on its independent research and review, the California Energy Commission (Energy Commission) believes that the potential is low for significant adverse cumulative impacts to the project from geologic hazards during its design life and to potential geologic, mineralogic, and paleontologic resources from the construction, operation, and closure of the proposed project. It is staff's opinion that the GWF Tracy project can be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards (LORS) and in a manner that both protects environmental quality and assures public safety, to the extent practical.

INTRODUCTION

In this section, Energy Commission staff discusses the potential impacts of geologic hazards on the proposed GWF Tracy project as well as the GWF Tracy project's impact on geologic, mineralogic, and paleontologic resources. Staff's objective is to ensure that there would be no consequential adverse impacts to significant geological and paleontological resources during the project construction, operation, and closure and that operation of the plant would not expose occupants to high-probability geologic hazards. A brief geological and paleontological overview is provided. The section concludes with staff's proposed monitoring and mitigation measures for geologic

hazards and geologic, mineralogic, and palentologic resources, with the proposed conditions of certification. Conditions of certification are conditions with respect to design and/or construction, required of the applicant by the Energy Commission as a part of its approval, which outline required procedures to mitigate impacts to potential resources and potential impacts to the facility from geologic hazards.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Applicable laws, ordinances, regulations, and standards (LORS) are listed in the application for certification (AFC) (GWF 2008a). The following briefly describes the current LORS for both geologic hazards and resources and mineralogic and paleontologic resources.

Geology and Paleontology Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
	The proposed GWF Tracy is not located on federal land. There are no federal LORS for geologic hazards and resources for this site.
State	
California Building Code (2007)	The CBC (2007) includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control). The CBC has adopted provisions in the International Building Code (ICC 2006).
Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code (PRC), sections 2621–2630	The act mitigates against surface fault rupture of known active faults beneath occupied structures. Requires disclosure to potential buyers of existing real estate and a 50-foot setback for new occupied buildings. The project site is not located within a designated Alquist-Priolo Fault Zone.
The Seismic Hazards Mapping Act, PRC sections 2690–2699	Areas are identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches.
PRC, Chapter 1.7, sections 5097.5 and 30244	The code regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.
Warren-Alquist Act, PRC, sections 25527 and 25550.5(i)	The Warren-Alquist Act requires the Energy Commission to “give the greatest consideration to the need for protecting areas of critical environmental concern, including, but not limited to, unique and irreplaceable scientific, scenic, and educational wildlife habitats; unique historical, archaeological, and cultural sites…” With respect to paleontologic resources, the Energy Commission relies on guidelines from the Society for Vertebrate Paleontology (SVP), indicated below.

Applicable Law	Description
Society for Vertebrate Paleontology (SVP), 1995	The "Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures" is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. The measures were adopted in October 1995 by the SVP, a national organization of professional scientists.
Local	
2007 California Building Code	These codes address the excavation, grading, and earthwork construction, not limited to construction relating to earthquake safety and seismic activity hazards.
County of San Joaquin General Plan (1992), section VI	The section requires a general plan for long-term development. Under this plan, paleontological resources shall be protected and preserved.
City of Tracy General Plan (2025), section 6.0	The plan indicates that City staff shall require property owners/developers to provide studies to document the presence/absence of archaeological and/or paleontological resources for areas with documented or inferred resource presence. On properties where resources are identified, a detailed mitigation plan shall ensue, including a monitoring program and recovery and/or in situ preservation plan, based on the recommendations of a qualified specialist.

SETTING

The proposed GWF Tracy project would involve modification of the existing TPP, a 169-megawatt (MW) simple cycle power plant, into a combined cycle power plant with an additional net nominal generating capacity of 145 MW. The GWF Tracy project would occupy a 16.38-acre, fenced site within the existing GWF-owned 40-acre parcel in an unincorporated portion of San Joaquin County immediately southwest of Tracy, California. This modification would require several new and/or modified components and features within the site including heat recovery steam generators; selective catalytic reduction systems; exhaust stacks; a natural gas-fired auxiliary boiler; a condensing steam turbine generator; a lube oil cooler; an air-cooled condenser unit; fire/service water storage tanks; a high efficiency oxidation catalyst system; a diesel-fired emergency firewater pump; a 12.3-acre construction lay down and parking area; landscaping and irrigation systems; a storm water detention basin; storm water evaporation/percolation basins; water piping systems; a natural gas piping system; a storm drainage collection system; a wastewater treatment system; a 115-kilovolt (kV) switchyard and overhead transmission line; and tubular steel transmission structures. In addition, three short segments of transmission line would be reconductored as part of the project: one 0.7-mile segment adjacent to the GWF Tracy site, and two segments—1.6-mile and 0.7-mile—near the intersection of I-5 and I-205 and near the Kasson Substation northeast of the GWF Tracy site, respectively. The reconductoring would only involve the replacement of the existing conductors with larger ampacity conductors and therefore, no off-site ground disturbance for linear features is anticipated.

REGIONAL SETTING

The GWF Tracy site is located in San Joaquin County, California, along the boundary between the Coast Ranges and the Great Valley (Central Valley) physiographic provinces (GWF 2008a). The Great Valley is approximately 400 miles long and 60 miles wide, bounded on the north by low-lying hills; on the northeast by the volcanic plateau of the Cascade Range; on the west by the Coast Ranges; on the east by the Sierra Nevada; and on the south by the Coast Ranges and the Tehachapi Mountains. The northern third of the valley is known as the Sacramento Valley, while the southern two-thirds are known as the San Joaquin Valley. The Great Valley is characterized by dissected uplands and relatively undeformed low alluvial plains and fans, river flood plains and channels, and lake bottoms (GWF 2008a). In the late Cenozoic era, much of the San Joaquin Valley was occupied by shallow brackish and freshwater lakes. Much of the valley fill alluvium is underlain by marine and non-marine sedimentary rocks and crystalline basement that have undergone anticlinal and synclinal folding and faulting related to regional tectonism (GWF 2008a). This tectonism has been uplifting the coast ranges since the middle Jurassic period.

PROJECT SITE DESCRIPTION

The GWF Tracy project site is located in Section 36, Township 2 South, Range 4 East of Mount Diablo Meridian at approximately 37.71 degrees north latitude by 121.49 degrees west longitude. The site is located within a designated industrial zone in the southwestern portion of the Tracy city limit. The project site elevation varies from approximately 155 to 180 feet above mean sea level (msl), and the site generally slopes down to the northeast at an approximate grade of 1%.

The site is immediately underlain by Quaternary alluvium deposits that form the Great Valley province. These sedimentary deposits are interbedded light-gray to grayish-brown to yellowish-brown gravel, sand, silt, and clay (USGS 1993). The sedimentary deposits extend to as much as 3,000 feet and are underlain by Tertiary to Jurassic age sedimentary rocks of the Great Valley Sequence to an approximate depth of 12,000 feet. Mesozoic and Paleozoic age crystalline rocks of basement complex are present below 12,000 feet in depth (USGS 1991).

The site is reportedly underlain by stiff to hard, moderately to highly expansive clay soils that extend from the surface to depths between two and seven feet. The surficial clay soils have been classified as dry to moist, lean to fat clay and as containing medium to high plasticity fines (GWF 2008a). This surface clay layer is underlain by sandy silt, sandy clay, and/or silty clay soils and occasional layers of sand and gravel to the depth of exploration (GWF 2008a). The fine grain soils have been classified as moist very stiff to hard sandy silt to sandy lean clay, while the granular soils have been classified as saturated very dense silty sand with gravel to clayey gravel with sand.

The depth to the groundwater varied between 25 and 50 feet below the ground surface at the time of exploration (GWF 2008a).

Several active and potentially active faults related to regional strike-slip faulting and compressional tectonics are present within 50 miles of the GWF Tracy site, and EQFAULT™ Version 3.00 was used to model these potential seismic sources (Blake

2006a). The various faults are listed in **Geology and Paleontology Table 2**, along with the type, orientation (strike), maximum earthquake magnitude, and distance from the project site. The peak acceleration, fault type, and fault class for each fault is also given. The fault locations can be found on the California Division of Mines and Geology Fault Activity Map of California (CDMG 1994) and United States Geological Survey Fault Maps (USGS 2008b). The sense of movement and fault class were derived from the California Department of Conservation Fault Parameters (CDC 2002).

Geology and Paleontology Table 2
Active Faults Relative to the Proposed GWF Tracy Site

Fault Name	Distance from Site (miles)	Maximum Earthquake Magnitude (Mw)	Estimated Peak Site Acceleration (g)	Fault Type and Strike	Fault Class
GREAT VALLEY 7	0.1	6.7	0.640	Reverse (West)	B
GREENVILLE (FLOATING)	9.4	6.2	0.176	Right lateral – Strike slip	B
GREENVILLE (GS+GN)	9.4	6.9	0.260	Right lateral – Strike slip	B
GREENVILLE (GS)	9.4	6.6	0.218	Right lateral – Strike slip	B
GREENVILLE (GN)	9.6	6.7	0.222	Right lateral – Strike slip	B
MOUNT DIABLO (MTD)	15.3	6.7	0.193	Reverse (Northeast)	B
CALAVERAS (CS+CC+CN)	22.6	6.9	0.137	Right lateral – Strike slip	B
CALAVERAS (FLOATING)	22.6	6.2	0.093	Right lateral – Strike slip	B
CALAVERAS (CC+CN)	22.6	6.2	0.095	Right lateral – Strike slip	B
CALAVERAS (CN)	22.6	6.8	0.127	Right lateral – Strike slip	B
GREAT VALLEY 8	24.7	6.6	0.131	Reverse (West)	B
CALAVERAS (CC)	25.2	6.2	0.087	Right lateral – Strike slip	B
CALAVERAS (CS+CC)	25.2	6.4	0.093	Right lateral – Strike slip	B
CALAVERAS (CS+CC FLOATING)	25.2	6.2	0.086	Right lateral – Strike slip	B
HAYWARD (HS+HN+RC)	26.3	7.3	0.145	Right lateral – Strike slip	A
HAYWARD (FLOATING)	26.3	6.9	0.120	Right lateral – Strike slip	A
HAYWARD (HS+HN)	26.3	6.9	0.120	Right lateral – Strike slip	A
HAYWARD (HS)	26.3	6.7	0.106	Right lateral – Strike slip	A
GREAT VALLEY 5	29.2	6.5	0.109	Reverse (West)	B
CONCORD/GV (CON+GVS+GVN)	30.2	6.7	0.098	Right lateral – Strike slip	B
CONCORD/GV (CON+GVS)	30.2	6.6	0.091	Right lateral – Strike slip	B
CONCORD/GV (CON)	30.2	6.3	0.077	Right lateral – Strike slip	B
CONCORD/GV (FLOATING)	30.2	6.2	0.075	Right lateral – Strike slip	B
ORTIGALITA	32.5	7.1	0.113	Right lateral – Strike slip	B
CONCORD/GV (GVS+GVN)	39.2	6.5	0.071	Right lateral – Strike slip	B
CONCORD/GV (GVS)	39.2	6.2	0.062	Right lateral – Strike slip	B
MONTE VISTA – SHANNON	39.5	6.7	0.096	Reverse (West)	B
HAYWARD (HN+RC)	40.3	7.1	0.097	Right lateral – Strike slip	A
HAYWARD (HN)	40.3	6.5	0.070	Right lateral – Strike slip	A
SAN ANDREAS (SAS+SAP+SAN)	45.5	7.8	0.124	Right lateral – Strike slip	A
SAN ANDREAS (FLOATING)	45.5	6.9	0.079	Right lateral – Strike slip	A
SAN ANDREAS (SAP)	45.5	7.2	0.090	Right lateral – Strike slip	A
SAN ANDREAS (SAP+SAN)	45.5	7.7	0.117	Right lateral – Strike slip	A
SAN ANDREAS (SAP+SAN+SAO)	45.5	7.8	0.128	Right lateral – Strike slip	A
SAN ANDREAS (SAS+SAP)	45.5	7.4	0.103	Right lateral – Strike slip	A
SAN ANDREAS (SAS+SAP+SAN+SAO)	45.5	7.9	0.133	Right lateral – Strike slip	A
GREAT VALLEY 4	46.0	6.6	0.081	Reverse (West)	B
SAN ANDREAS (SAS)	46.4	7.0	0.083	Right lateral – Strike slip	A
FOOTHILLS FAULT SYSTEM 1	46.5	6.5	0.076	Normal – Right lateral - Oblique	C

MITIGATION

This section considers two types of impacts. The first is geologic hazards, which could impact the proper functioning of the proposed facility and create life/safety concerns. The second is the potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

No federal LORS concerning geologic hazards and geologic and mineralogic resources apply to this project. The California Building Standards Code (CBSC) and CBC (2007) provide geotechnical and geological investigation and design guidelines, which engineers must follow when designing a facility. As a result, the criteria used to assess the significance of a geologic hazard include evaluating each hazard's potential impact on the design and construction of the proposed facility. Geologic hazards include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, tsunamis, seiches, and others as may be dictated by site-specific conditions.

The California Environmental Quality Act (CEQA) guidelines, Appendix G, provide a checklist of questions that lead agencies typically address.

- Section (V) (c) includes guidelines that determine if a project will either directly or indirectly destroy a unique paleontological resource or site or a unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) focus on whether or not the project would expose persons or structures to geologic hazards.
- Sections (X) (a) and (b) concern the project's effects on mineral resources.

Staff has reviewed geologic and mineral resource maps for the surrounding area, as well as site-specific information provided by the applicant, to determine if geologic and mineralogic resources exist in the area and to determine if plant operations could adversely affect any such resources.

Staff reviewed existing paleontologic information and requested records searches from the University of California Museum of Paleontology (at Berkeley) for the area surrounding the site. Site-specific information generated by the applicant for the GWF Tracy site, as well as existing documentation associated with the TPP site, was also reviewed. All research was conducted in accordance with accepted assessment protocol (SVP 1995) to determine whether any known paleontologic resources exist in the general area. If such resources are present or likely to be present, conditions of certification outline required procedures to mitigate impacts to potential resources and are proposed as part of the project's approval.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Ground shaking, foundation settlement and expansive clay soils represent the main geologic hazards at this site. These potential hazards can be effectively mitigated through facility design by incorporating recommendations contained in a project-specific geotechnical report as required by the CBC (2007). The requirements of the proposed

FACILITY DESIGN Conditions of Certification **GEN-1, GEN-5,** and **CIVIL-1** in the **FACILITY DESIGN** section should also aid in mitigating these impacts to a less than significant level.

The geologic units at the project site typically consist of fine grain and clay soils with minor amounts of granular materials present as relatively thin interbeds (i.e. generally less than five feet thick) to the depths explored, approximately 100 feet. The geologic units at the site are widespread throughout the southwestern part of the San Joaquin Valley and, as such, are not unique in terms of recreational, commercial, or scientific value (GWF 2008a). In addition, the project area is not within an area of significant geologic resources according to the San Joaquin County General Plan (1992). Finally, staff reviewed existing documentation that outlines aggregate, oil, geothermal, and natural gas production in the area (CDOGGR 2008). The information provided and the documentation reviewed indicate that the project should not impact, directly or indirectly, available geologic resources.

Scientifically significant fossil records occur in the Quaternary sediments lying immediately beneath the fill surface of the project area (GWF 2008a), and resources were encountered during construction of the TPP, although recovered paleontological resources from the site to date have been fragmentary large vertebrate remains present as inclusions in alluvium (Lawler Associates Geoscience 2003). Since the proposed GWF Tracy site construction would include significant amounts of grading, excavation, and utility trenching, staff considers that there is a high probability of encountering paleontological resources during such activities, particularly when these activities fully penetrate any artificial fill and encounter native Quaternary alluvium. Proposed Conditions of Certification **PAL-1** through **PAL-7** are designed to mitigate direct impacts to paleontological resources, as discussed above, to less-than-significant levels. These conditions essentially require a worker education program in conjunction with the monitoring of earthwork activities by a qualified professional paleontologist (a paleontologic resource specialist, or PRS).

The proposed conditions of certification allow the Energy Commission's compliance project manager (CPM) and the applicant to adopt a compliance monitoring scheme ensuring compliance with LORS applicable to geologic hazards and the protection of geologic, mineralogic, and paleontologic resources.

Based on the information below, it is staff's opinion that the potential for significant adverse direct or indirect impacts to the project from geologic hazards and to potential geologic, mineralogic, and paleontologic resources from the proposed project is low, assuming the proposed conditions of certification are adopted and enforced.

GEOLOGICAL HAZARDS

The AFC (GWF 2008a) provides documentation of potential geologic hazards at the proposed plant site. Review of the AFC, coupled with staff's independent research, indicates that the possibility of geologic hazards impacting the plant site during its practical design life is low. Geologic hazards, such as strong ground shaking, expansive clay soils, and settlement due to loading compressible soils must be addressed in the project geotechnical report per CBC (2007) requirements.

Staff's independent research included the review of available geologic maps, reports, and related data of the GWF Tracy plant site. Geological information was available from the California Geological Survey (CGS), the CDMG, the USGS, and other government organizations. Since 2002, the CDMG has been known as the CGS.

Faulting and Seismicity

Type A faults have slip-rates of ≥5 millimeters per year (mm/year) and are capable of producing an earthquake of magnitude 7.0 or greater. Type B faults have slip-rates of 2 to 5 mm per year and are capable of producing an earthquake of magnitude 6.5 to 7.0. Fourteen Type A Faults and 24 Type B faults have been identified within 50 miles of the proposed GWF Tracy Site. The fault type, potential magnitude, and distance from the site were summarized previously in **Geology and Paleontology Table 2**.

The Alquist-Priolo Act of 1973 and subsequent California state law (California Code of Regulations 2007) require that all occupied structures be set back 50 feet or more from the surface trace of an active fault. Since no active faults have been documented within the GWF Tracy site, setbacks from occupied structures would not be required.

Energy Commission staff reviewed the CDMG publication *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions* (1994) and Alquist-Priolo Special Studies Zone mapping and reports (CDMG 2003; CGS 2002; and Hart and Bryant 1999). No active faults are shown on published maps as crossing the boundary of new construction at the proposed GWF Tracy site or its proposed transmission routes. The nearest major active fault is the Segment 7 of the Great Valley Fault located approximately 500 feet southwest of the project site (**Geology and Paleontology Table 2**).

Segment 7 of the Great Valley Fault has been mapped less than 0.1 miles southwest of the site and controls the seismic impact to the site. This fault has been identified as a Type B fault with reverse and 15-degree-west dipping structure and as having a slip rate of approximately 1.5 mm/year. The next closest fault from the site is the Greenville Fault that is mapped as being 9.4 miles west of the site. The Greenville Fault is a Type B fault and has a slip rate of approximately 5.0 mm/year. The closest Type A fault from the site, the Hayward Fault, is mapped as being more than 26 miles west of the site and as having a slip rate of as much as 9.0 mm/year (CDC 2002). The Greenville Fault, Hayward Fault, and most of other faults listed on **Geology and Paleontology Table 2** within 50 miles of the GWF Tracy plant site are northwest-striking, right-lateral strike-slip faults related to regional transform faulting, of which the San Andreas Fault Zone is the central structure.

Based on the geotechnical investigation performed for this project (GWF 2008a), the site soil class is assumed to be Class D. The estimated peak horizontal ground acceleration for the GWF Tracy site is 0.78 times the acceleration of gravity (0.78g) for a bedrock acceleration based on 2% probability of exceedence in 50 years based on 2007 CBC criteria (USGS 2008a).

Liquefaction

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. The GWF Tracy site is predominantly underlain by very stiff to hard clay and silt soils, in addition to minor amounts of interbedded dense to very dense sand and gravel layers (GWF 2008a). Based on this subsurface stratigraphy and a depth to groundwater on the order of 25 to 50 feet (GWF 2008a), the potential for liquefaction at this site is considered to be low.

Lateral Spreading

Lateral spreading of the ground surface can occur within liquefiable beds during seismic events. Lateral spreading generally requires an abrupt change in slope, such as a nearby steep hillside or deeply eroded stream bank, but can also occur on gentle slopes. Other factors such as distance from the epicenter, magnitude of the seismic event, and thickness and depth of liquefiable layers also affect the amount of lateral spreading. Because the GWF Tracy site is not subject to significant liquefaction, the potential for lateral spreading of the site surface during seismic events is negligible.

Dynamic Compaction

Dynamic compaction of soils can occur when relatively unconsolidated granular materials experience vibration associated with seismic events. 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. As the site is underlain by clays, silts, and dense sands, the potential for dynamic compaction of site soils during an earthquake is low.

Hydrocompaction

Hydrocompaction (also known as hydro-collapse) is generally limited to young soils that were deposited rapidly in a saturated state, most commonly by a flash flood. The soils dry quickly, leaving an unconsolidated, low density deposit with a high percentage of voids. Foundations built on these types of compressible materials can settle excessively, particularly when landscaping irrigation dissolves the weak cementation that is preventing the immediate collapse of the soil structure. Based on the consistency of the silt soils present to depth at the GWF Tracy site (GWF 2008a), the potential for hydrocompaction is minimal at this site.

Subsidence

Local subsidence or settlement may occur when areas containing compressible soils are subjected to foundation loads. Regional subsidence could occur due to future changes in groundwater pumping or development of hydrocarbon reserves in the Tracy area. No known subsidence problems exist in the GWF Tracy project area per the San Joaquin County General Plan (San Joaquin County 1992). Recommendations for mitigating the effects of subsidence due to foundation loads must be provided in the project-specific geotechnical report as required by the CBC (2007) and proposed **FACILITY DESIGN** Conditions of Certification **GEN-1**, **GEN-5,** and **CIVIL-1**. When necessary, mitigation is normally accomplished by over-excavation and replacement of the compressible soils for lightly loaded foundations. For heavily loaded foundations, deep foundations are commonly used to support the loads.

Expansive Soils

Soil expansion occurs when clay-rich soils with an affinity for water exist at a moisture content below their plastic limit. The addition of moisture from irrigation, precipitation, capillary tension, waterline breaks, etc. causes the clay soils to absorb water molecules into their structure, which in turn causes an increase in the overall volume of the soil. This increase in volume can correspond to excessive movement (heave) of overlying structural improvements. Plasticity index tests, which are also an indicator of the expansive potential and clay content in soils, have been performed on representative samples of the surficial clay soils at this site (GWF 2008a). The test results indicate the surficial clay soils exhibit medium to high plasticity and are moderately to highly expansive. Recommendations for mitigating the effects of expansive clays soils must be provided in the project-specific geotechnical report as required by CBC (2007) requirements and proposed **FACILITY DESIGN** Conditions of Certification **GEN-1**, **GEN-5,** and **CIVIL-1**. When necessary, mitigation is normally accomplished by over-excavation and replacement of the expansive soils beneath structural improvements, although lime treatment of the expansive soils is commonly used beneath pavements.

Landslides

The GWF Tracy site is relatively flat, exhibiting an approximate slope of 1% to the northeast (GWF 2008a). The flat lying nature and the absence of topographically high ground within or immediately upgradient from the site suggest it is not susceptible to landslide activity.

Flooding

The Federal Emergency Management Agency (FEMA) has identified the GWF Tracy site as lying in areas outside the 0.2% annual chance flood plain (FEMA 1987). Therefore, the potential impact of flooding on the proposed GWF Tracy project is negligible.

Tsunamis and Seiches

Tsunamis are large-scale, seismic sea waves caused by offshore earthquakes, landslides, and/or volcanic activity. Since the proposed GWF Tracy site lies inland more than 90 miles from the Pacific Ocean, potential impacts to the GWF Tracy site due to tsunamis is negligible. No large inland surface water bodies capable of producing seiches are located near the proposed plant site. Therefore, potential impacts to the GWF Tracy site due to a seiche is negligible.

GEOLOGIC, MINERALOGIC, AND PALEONTOLOGIC RESOURCES

Based on mapping information developed by the CDC, the GWF Tracy site and associated linears lie in Mineral Resource Zone 1 (MRZ 1), which is defined as areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence (CDC 1988). Energy Commission staff has also reviewed applicable geologic maps and reports for this area (CDC 2006; CDC 2001; CDC 2000; CDC 1999; CDC 1992; CDC 1980; CDC 1982; CDC 1988; CDMG 1999; CDMG 1998; CDMG 1990; CDMG 2003; USGS 1993; USGS 1981; UCMP 2008a; UCMP 2008b; City of Tracy 2025; San Joaquin County 1992). An important Portland cement concrete-grade aggregate resource area, the Corral Hollow

Creek Alluvial Fan, is located approximately two miles southeast of the project site. This area is designated by the CDC as MRZ 3, which is defined as an area containing mineral deposits and as containing valuable aggregate deposits (CDC 1988). The depth of this aggregate deposit extends in excess of 200 feet (CDC 1988). Significant Portland cement concrete (PCC) aggregate quarries are currently in operation approximately seven miles southeast of the project site (CGS 2006). An area approximately 1.5 miles southwest of the project site has also been mapped by the CDC as MRZ 2, which is defined as an area where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists (CDC 1988).

Natural gas fields are present approximately 3.5 miles north of the project site (CDOGGR 2008); however, a natural gas exploration well advanced immediately southwest of the project site was dry and abandoned (CDOGGR 2008).

Since the site is mapped as lying in an MRZ-1, site-specific exploration did not reveal the presence of any significant amount of potential PCC aggregate deposits (GWF 2008a); natural gas exploration in the immediate vicinity of the project site did not encounter any such resources; and given the absence of rock outcrops on or near the site surface, there is very low potential for this site to have economically valuable geologic or mineralogic deposits.

Energy Commission staff has reviewed the paleontological resources assessment contained in the AFC (GWF 2008a) and supplemental information (CH2M Hill 2008a). In addition, staff has reviewed existing paleontological documentation associated with construction of the TPP (Lawler Associates Geoscience 2003). Finally, staff has also reviewed the paleontological literature and records searches conducted by personnel at the University of California, Museum of Paleontology (UCMP 2008a), and an independent search was carried out within the on-line records database maintained by the UCMP (2008b). The results of this review indicate that several paleontological localities have been recorded southwest and northwest of the GWF Tracy site and were associated with construction of the Delta-Mendota Canal, and paleontological resources were encountered during construction of the TPP. All the records are from the Pleistocene alluvium and were found during construction of the Delta-Mendota canal. As a result, the potential to encounter paleontological resources during construction of the GWF Tracy project is high; however, potential impacts to such resources can be effectively mitigated through the Conditions of Certification **PAL-1** through **PAL-7**.

Construction Impacts and Mitigation

The design-level geotechnical investigation required for the project by the CBC (2007) and proposed **FACILITY DESIGN** Condition of Certification **GEN-1** provide standard engineering design recommendations for mitigation of potential expansive clay soils, as well as excessive settlement due to compressible soils or dynamic compaction, as appropriate (see proposed conditions of certification in the **FACILITY DESIGN** section of this Preliminary Staff Assessment).

Based on site-specific exploration (GWF 2008a), no viable geologic or mineralogic resources are known to be present at the plant site and are not expected to be present along the proposed transmission line route. The potential to impact significant

paleontological resources in Quaternary sediments present at depth, especially in deeper excavations, is considered to be high. Fill materials have a negligible paleontological sensitivity. Construction of the proposed project will include grading, excavation, and utility trenching. Staff considers the probability of encountering paleontological resources to be high in excavations which penetrate through the surficial fill materials and encounter native Quaternary sediments, and the potential for encountering fossils will increase with the depth of cut.

Proposed Conditions of Certification **PAL-1** through **PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less-than-significant level. Essentially, these conditions require a worker education program in conjunction with monitoring of earthwork activities by qualified professional paleontologists (paleontologic resource specialist, or PRS). Earthwork is halted any time potential fossils are recognized by either the paleontologist or the worker. When properly implemented, the conditions of certification yield a net gain to the science of paleontology since fossils that would not otherwise have been discovered can be collected, identified, studied, and properly curated. A paleontological resource specialist is retained, for the project by the applicant, to produce a monitoring and mitigation plan, conduct the worker training, and provide the on-site monitoring. During the monitoring, the PRS can and often does petition the Energy Commission for a change in the monitoring protocol. Most commonly, this is a request for lesser monitoring after sufficient monitoring has been performed to ascertain that there is little chance of finding significant fossils. In other cases, the PRS can propose increased monitoring due to unexpected fossil discoveries or in response to repeated out-of-compliance incidents by the earthwork contractor.

Based upon the literature and archives search, field surveys, and compliance documentation for the TPP and proposed for the GWF Tracy project, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the project. Energy Commission staff believes that the facility can be designed and constructed to minimize the effect of geologic hazards at the site during the project life and that impacts to vertebrate fossils encountered during construction of the power plant and associated linears would be mitigated to a level of insignificance.

Operation Impacts and Mitigation

Operation of the proposed plant facilities should not have any adverse impact on geologic, mineralogic, or paleontologic resources. Potential geologic hazards, including strong ground shaking, expansive soils, and foundation settlement due to compressible soils can be effectively mitigated through facility design (see proposed Conditions of Certification **GEN-1, GEN-5,** and **CIVIL-1** in the **FACILITY DESIGN** section) to the degree that these potential hazards should not affect operation of the facility.

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts correspond to a proposed project's potential incremental effect, together with other closely related past, present, and reasonably foreseeable future projects whose impacts on geologic, mineralogic, and paleontologic resources may compound or increase the incremental effect of the proposed project on such resources.

Potential cumulative effects, as they pertain to geologic hazards, are essentially limited to regional subsidence due to groundwater withdrawal. As this project will not involve pumping of groundwater, the proposed GWF Tracy project will not contribute to any increase of this potential hazard. In addition, a significant number of large-scale groundwater pumping operations would have to be constructed to have any significant impact on the proposed facility. Since heavily loaded foundations will most likely include deep foundations to mitigate potential settlement due to foundation loads, potential effects due to regional subsidence under such conditions would also be effectively mitigated.

Although not encountered during site-specific exploration (GWF 2008a), viable geologic resources are present in the vicinity of the project site; however, the viable geologic units are widespread alluvial deposits that occur throughout the southwestern part of the San Joaquin Valley and are therefore not unique in terms of recreational, commercial, or scientific value. As a result, the proposed GWF Tracy project should have negligible cumulative effect on these resources.

Paleontological resources have been documented in the general area of the project and were documented during construction of the TPP (Lawler Associates Geoscience 2003). As the value of paleontological resources is associated with their discovery within a specific geologic host unit, the potential impacts to paleontological resources due to construction activities will be mitigated as required by proposed Conditions of Certification **PAL-1** through **PAL-7**. Implementation of these conditions should result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved.

Based on the above discussion, staff believes that the potential for significant adverse cumulative impacts to the proposed project from geologic hazards during the project's design life is low and that the potential for impacts to geologic, mineralogic, and paleontologic resources is also low.

Based upon the literature and archives search, field surveys, and compliance documentation for the existing TPP and proposed for the GWF Tracy project, the applicant proposes monitoring and mitigation measures for construction of the project. Energy Commission staff agrees with the applicant that the project can be designed and constructed to minimize the effects of geologic hazards at the site and that impacts to scientifically significant vertebrate and invertebrate fossils encountered during construction would be mitigated to levels less than significant.

The proposed conditions of certification allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme ensuring compliance with applicable LORS for geologic hazards and geologic, mineralogic, and paleontologic resources.

FACILITY CLOSURE

Facility closure activities are not expected to impact geologic or mineralogic resources since no such resources are known to exist at either the project location or along its proposed linears. In addition, the decommissioning and closure of the project should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of

the ground disturbed during plant decommissioning and closure would have been already disturbed, and mitigated as required, during construction and operation of the project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any agency or public comments regarding geologic hazards, mineral resources, or paleontology.

CONCLUSIONS

The applicant will be able to comply with applicable LORS, provided that the proposed conditions of certification are adopted and enforced. The design and construction of the project should have no adverse impact with respect to geologic, mineralogic, and paleontologic resources. Staff proposes to ensure compliance with applicable LORS through the adoption of the proposed conditions of certification listed below.

PROPOSED CONDITIONS OF CERTIFICATION

General conditions of certification with respect to engineering geology are proposed under Conditions of Certification **GEN-1, GEN-5,** and **CIVIL-1** in the **FACILITY DESIGN** section. Proposed paleontological conditions of certification follow in **PAL-1** through **PAL-7**. It is staff's opinion that the likelihood of encountering paleontologic resources is high on portions of the plant site and along buried pipelines connecting to the plant. Staff will consider reducing monitoring intensity, at the recommendation of the project PRS, following examination of sufficient, representative, deep excavations to fully understand site stratigraphy.

PAL-1 The project owner shall provide the Compliance Project Manager (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 keep resumes on file for qualified Paleontological Resource Monitors (PRMs). If a PRM is replaced, the resume 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;

2. Ability to recognize and collect fossils in the field;

3. Local geological and biostratigraphic expertise;

4. Proficiency in identifying vertebrate and invertebrate fossils; and

5. 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 of 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 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's 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 plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet. If the footprint of the project or its linear facilities change, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds 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. Before work commences 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 the following week and 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 five 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 the basis of discussion when 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 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 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. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;

5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;

6. A discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;

7. 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;

8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;

9. Identification of the institution that has agreed to receive 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

10. 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 activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for the following workers: project managers, construction supervisors, foremen, and general workers involved with or who 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 a CPM-approved video or in-person presentation. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials,

or other areas of interest or concern. No ground disturbance shall occur prior to CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect these 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 for project sites containing units of high paleontologic 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 WEAP certification of completion form signed by each worker indicating that he/she has 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 for workers 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 to use a video for interim training.
3. If the owner requests an alternate paleontological trainer, 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 (in-person or video) 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) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. 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 from the accepted schedule 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 and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.

2. The project owner shall ensure that the PRM(s) keeps a daily monitoring log 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 notifies the CPM within 24 hours of the occurrence 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 within 24 hours, or Monday morning in the case of a weekend event where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. 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, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of 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 or any changes to the monitoring plan that have

been approved by the CPM. If no monitoring took place during the month, the report 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 project construction.

Verification: The project owner shall maintain in his/her 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 project completion and approval of the CPM-approved paleontological resource report (see **PAL-7**). The project owner shall be responsible for paying 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 submit it 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 below the level of significance.

Verification: Within 90 days after completion of ground-disturbing activities, including landscaping, the project owner shall submit the PRR under confidential cover to the CPM.

PAL-8 The project owner shall include in the facility closure plan a description regarding the potential for closure of the facility to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM, 12 months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Verification: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure. The project owner shall include a description of closure activities described above in the facility closure plan.

Certification of Completion
Worker Environmental Awareness Program
Tracy Combined Cycle Power Plant (08-AFC-07)

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, paleontological, and biological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
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Cultural Trainer: _____ Signature: _____ Date: ___/___/____

PaleoTrainer: _____ Signature: _____ Date: ___/___/____

Biological Trainer: _____ Signature: _____ Date: ___/___/____

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POWER PLANT EFFICIENCY

Testimony of Erin Bright

SUMMARY OF CONCLUSIONS

The GWF Tracy Combined Cycle Power Plant, if constructed and operated as proposed, would generate 314 megawatts (MW) (nominal net output) of electric power at an overall project fuel efficiency of 45.2% lower heating value (LHV) with duct burning. While it would consume substantial amounts of energy, it would do so in the most efficient manner practicable. It would not create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, and would not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. California Energy Commission staff therefore concludes that the project would present no significant adverse impacts upon energy resources.

INTRODUCTION

The California Energy Commission (Energy Commission) makes findings as to whether energy use by the GWF Tracy Combined Cycle Power Plant project (GWF Tracy) would result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that GWF Tracy'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 impact. 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

No federal, state, or local/county laws, ordinances, regulations, or standards (LORS) apply to the efficiency of this project.

SETTING

GWF Energy, LLC (GWF) proposes to convert its existing 169-MW Tracy Peaker Plant in San Joaquin County to a 314-MW (nominal net output) combined cycle power plant. GWF Tracy would be configured in a two-on-one combined cycle train consisting of two existing General Electric frame 7EA combustion turbine generators (CTGs), two new multi-pressure heat recovery steam generators (HRSGs) with duct burners, and one new steam turbine generator (STG) with an air cooled condenser for exhaust steam

cooling (GWF 2008a, AFC §§ 1.1, 2.1, 2.2.2). For air emissions control, the CTGs would be equipped with dry low-NOx combustors and the HRSGs with selective catalytic reduction (SCR) systems. Natural gas would be delivered to the project site through the existing Pacific Gas and Electric (PG&E) gas pipeline, which currently serves the Tracy Peaker Project (GWF 2008a, AFC §§ 2.2.6, 4.1).

ASSESSMENT OF IMPACTS

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE OF ENERGY RESOURCES

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).

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 low ambient conditions and at baseload operation with duct firing, GWF Tracy would be expected to consume natural gas at a maximum rate of 2,915 million Btu per hour, higher heating value (GWF 2008a, AFC § 2.2.3). This is a substantial rate of energy consumption and holds the potential to impact energy supplies. Under expected project conditions, electricity would be generated at a full load efficiency of approximately 45.2% lower heating value (LHV) with duct burning and 48.3% LHV without (GWF 2008a, AFC Figure 2.1-3C).

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

The applicant has described its sources of supply of natural gas for the project (GWF 2008a, AFC §§ 2.2.6, 4.1). Natural gas for GWF Tracy would be supplied from the existing PG&E system via an existing pipeline that currently serves the CTGs at the Tracy Peaker Project. This line would be tapped to feed the HRSG duct burners in addition to the CTGs for GWF Tracy. The PG&E system is capable of delivering the required quantity of gas to the project. The PG&E natural gas supply represents a

reliable source of natural gas for this project. Therefore, it appears unlikely that the project could pose a substantial increase in demand for natural gas in California.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

Natural gas fuel would be supplied to the project by PG&E via an existing pipeline connection (GWF 2008a, AFC §§ 2.2.6, 4.1). There appears to be no real likelihood that GWF Tracy would require the development of additional energy supply capacity, since PG&E's regional supplies are considered plentiful.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of GWF Tracy or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT, AND UNNECESSARY ENERGY CONSUMPTION

GWF Tracy 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

GWF Tracy would be configured as a combined cycle power plant, in which electricity is generated by two gas turbine generators and additionally by a reheat steam turbine generator that operates on heat energy recovered from the gas turbines' exhaust (GWF 2008a, AFC §§ 1.3, 2.2.3, 2.2.4). 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 a steam turbine operating alone. Such a configuration is well suited to the large, steady loads met by a base load plant intended to supply energy efficiently for long periods of time.

The applicant proposes to use evaporative inlet air coolers, HRSG duct burners, multi-pressure HRSGs, and a steam turbine unit with an air cooled condenser to cool steam exhaust (GWF 2008a, AFC §§ 1.1, 2.1, 2.2.3, 2.2.4). Staff believes these features contribute to meaningful efficiency enhancement of GWF Tracy. The two-train CTG/HRSG configuration also allows for high efficiency during unit turndown because one CTG can operate at a more efficient full load while the other is shut down, rather than operating two CTGs at an inefficient 50% load.

GWF Tracy would include HRSG duct burners to augment heat to the STG cycle during high ambient temperatures when CTG capacity drops and for added power output. Duct firing also provides a number of operational benefits such as load following and balancing and optimizing the operation of the STG cycle.

Equipment Selection

The E-class advanced heavy duty gas turbines to be employed in GWF Tracy are not the most modern machines available; however, operating these turbines in a combined cycle configuration with a steam turbine generator would take advantage of otherwise wasted exhaust energy, offsetting efficiency losses in CTG operation. The applicant would employ two GE Frame 7EA combustion turbine generators in a two-on-one combined cycle power train nominally rated at 265 MW and 50.9% maximum full load efficiency LHV at International Organization for Standardization (ISO) conditions (GTW 2008). This rating differs from GWF Tracy's projected efficiency of 48.2% LHV, without duct burning, because of efficiency losses from parasitic loads and increased flow losses due to the selective catalytic reduction units used on the exhaust of each unit.

Efficiency of Alternatives to the Project

The project objectives include redevelopment and expansion of an existing power plant to support local supply requirements in San Joaquin County (GWF 2008a, AFC §§ 1.2, 6.1).

Alternative Generating Technologies

Alternative generating technologies for GWF Tracy are considered in the AFC (GWF 2008a, AFC § 6.6). Fossil fuels, nuclear, solar, biomass, hydroelectric, wind, and geothermal technologies are all considered. Given the project objectives, location, air pollution control requirements, and commercial availability of the above technologies, 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 more than two-thirds of the total operating costs of a fossil-fuel-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.

Modern gas turbines embody the most fuel-efficient electric generating technology available today. Currently available, large combustion turbine models can be grouped into three categories including conventional, advanced, and next generation. Advanced combustion turbines offer advantages for GWF Tracy. Their higher firing temperatures offer higher efficiencies than conventional turbines. They offer proven technology with numerous installations and extensive run time in commercial operation. Emission levels are also proven, and guaranteed emission levels have been reduced based on operational experience and design optimization by the manufacturers.

The turbines selected for GWF Tracy have been tailored to this specific project. While alternative turbines with similar, or slightly improved, performance specifications may be available, staff agrees that, given the intended operation of this project, the equipment chosen by the applicant is the best option.

The choice of cooling process for the steam turbine condenser also affects efficiency. The dry cooling system described in the AFC (GWF 2008a, AFC § 2.2.4.1.3) would

yield a lower efficiency than a wet cooling tower system on hot summer days. Efficiency could be approximately 1.5% lower with the air cooled condenser than with a wet cooling tower for the majority of the year, with greater efficiency drops anticipated for ambient temperatures at or above 100°F. Staff deems this a minor reduction, however, and reasonable in light of the vast improvements in the mitigation of water supply and wastewater disposal impacts to be derived from the use of dry cooling instead of wet cooling.

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 it 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.

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 choice of an evaporative cooler for gas turbine inlet air cooling would yield no significant adverse energy impacts.

In conclusion, the project configuration (combined cycle) and generating equipment (E-class gas turbines) chosen appear to represent the most efficient feasible combination to satisfy the project objectives. The two-train CTG/HRSG configuration also allows for high efficiency during unit turndown because one CTG can be shut down, leaving one fully loaded, efficiently operating CTG instead of having two CTGs operating at an inefficient 50% load. This offers an efficiency advantage over the larger machines during unit turndown. There are no alternatives that could significantly reduce energy consumption.

Staff, therefore, believes GWF Tracy would 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 would 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 AEP. Since natural gas would be burned by the power plants that are most competitive on the spot market, the

most efficient plants would likely run the most. The high efficiency of the proposed GWF Tracy project should allow it to compete very favorably, running at a high capacity factor, replacing less efficient power generating plants in the market, and therefore not impacting or even reducing the cumulative amount of natural gas consumed for power generation.

NOTEWORTHY PUBLIC BENEFITS

The applicant proposes to enhance power supply reliability in the California electricity market by meeting the needs of the state's energy demand and contributing to the electricity reserves in the region. By doing so in this most fuel-efficient manner, that is, redeveloping an existing peaking facility into a combined cycle facility, GWF Tracy would provide a benefit to the electric consumers of California.

CONCLUSIONS AND RECOMMENDATIONS

The project, if constructed and operated as proposed, would generate 314 MW (nominal net output) of electric power at an overall project fuel efficiency of 45.2% LHV with duct burning and 48.3% LHV without duct burning. While it would consume substantial amounts of energy, it would do so in the most efficient manner practicable. It would not create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, and would not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the project would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

AGENCY AND PUBLIC COMENTS

No agency or public comments were received regarding project efficiency.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

GTW 2008—*Gas Turbine World*, "Gas Turbine World 2008 Performance Specs," December 2007, pp. 29–35.

GWF 2008a. GWF Energy LLC/D. Wheeler (tn: 47105). Application for Certification for GWF Tracy Combined Cycle Power Plant Project, dated 7/10/2008. Submitted to CEC/Docket Unit on 7/18/2008.

Power 1994—*Power Magazine*, "Operating and Maintaining IPP/cogen Facilities." September 1994, p. 14.

POWER PLANT RELIABILITY

Testimony of Erin Bright

SUMMARY OF CONCLUSIONS

GWF Energy, LLC (GWF), the applicant, predicts an equivalent availability factor of 92 to 98%, which California Energy Commission staff believes is achievable. Based on a review of the proposal, staff concludes that GWF Tracy Combined Cycle Power Plant (GWF Tracy) would be built and operated in a manner consistent with industry norms for reliable operation, which should provide an adequate level of reliability. No conditions of certification are proposed.

INTRODUCTION

In this analysis, California Energy Commission (Energy Commission) staff addresses the reliability issues of the GWF Tracy 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 applicant has predicted an equivalent availability factor of 92-98% for GWF Tracy (see below), staff uses typical industry norms as a benchmark, rather than GWF's projection, to evaluate the project's reliability.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

No federal, state, or local/county laws, ordinances, regulations, or standards (LORS) apply to the reliability of this project.

SETTING

In the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the state's control area operators, such as the California Independent System Operator (California ISO), that purchase, dispatch, and sell electric power throughout the state. How the California ISO and other control area operators will ensure system reliability is an ongoing process; protocols are still being developed and

put in place that will allow sufficient reliability to be maintained under the competitive market system. “Must-run” power purchase agreements and “participating generator” agreements are two mechanisms being employed to ensure an adequate supply of reliable power.

In September 2005, California AB 380 (Núñez, Chapter 367, Statutes of 2005) became law. This modification to the Public Utilities Code requires the California Public Utilities Commission to consult with the California ISO to establish resource adequacy requirements for all load-serving entities (basically, public and privately owned utility companies). These requirements include maintaining a minimum reserve margin (extra generating capacity to serve in times of equipment failure or unexpected demand) and maintaining sufficient local generating resources to satisfy the load-serving entity’s peak demand and operating reserve requirements.

In order to fulfill this mandate, the California ISO has begun to establish specific criteria for each load-serving entity under its jurisdiction. These criteria guide each load-serving entity in deciding how much generating capacity and ancillary services to build or purchase, after which the load-serving entity issues power purchase agreements to satisfy these needs. As a load-serving entity, GWF is obligated to satisfy these criteria, which include maintaining a 15% reserve margin and increasing local generation to reduce reliance on imported power.

The California ISO’s mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants were to exhibit individual reliability sufficiently lower than this historical level, the assumptions used by California ISO to ensure system reliability would prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone an adequate shakeout period, and the effects of varying power plant reliability are thoroughly understood and compensated for, staff will recommend that power plant owners continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

As part of its plan to provide needed reliability, the applicant proposes to operate the 314-megawatt (MW) (nominal net output) GWF Tracy project, a combined cycle power plant, providing additional base load power capability in the San Joaquin County region (GWF 2008a, AFC § 1.2). The project is expected to achieve an equivalent availability factor (EAF) in the range of 92-98% (GWF 2008a, AFC § 2.4.1). The applicant expects to operate the plant at a capacity factor ranging from 50-78% with approximately 35% duct firing during each year of its operating life (GWF 2008a, AFC §§ 1.3, 2.2.2, 2.2.15).

ASSESSMENT OF IMPACTS

METHOD FOR DETERMINING RELIABILITY

The Energy 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.

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 the plant's 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 (GWF 2008a, AFC § 2.4.1), GWF Tracy would 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 GWF Tracy would be as reliable as other power plants on the electric system and would therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability would 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 (GWF 2008a, AFC §§ 2.4.5, 2.4.5.2) typical of the power industry. Equipment would be purchased from qualified suppliers based on technical and commercial evaluations. The project owner would 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 base load 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 project (GWF 2008a, AFC § 2.4.2; Table 2.4-1). The fact that the project would consist of two combustion turbine generators operating in parallel as independent equipment trains provides inherent reliability. A single equipment failure cannot disable more than one train, thus allowing the plant to continue to generate (at reduced output). Further, all plant ancillary systems are also designed with adequate redundancy to ensure continued operation in the face of equipment failure. Staff believes that equipment redundancy would be sufficient for a project such as this.

Maintenance Program

The applicant proposes to establish a preventive plant maintenance program typical of the industry (GWF 2008a, AFC §§ 2.2.8.2, 2.2.8.3, 2.2.12, 2.2.15, 2.4.1). Equipment manufacturers provide maintenance recommendations with their products; the applicant would base its maintenance program on these recommendations. The program will encompass preventive and predictive maintenance techniques. Maintenance outages would be planned for periods of low electricity demand. In light of these plans, staff expects that the project would 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

GWF Tracy would burn natural gas supplied by Pacific Gas and Electric Company (PG&E) from the PG&E system. Natural gas fuel would be supplied to the project via an existing PG&E on-site line that currently serves the Tracy Peaker Plant. An additional pipeline to serve the heat recovery steam generators (HRSGs) would be connected to the existing on-site natural gas supply lines (GWF 2008a, AFC §§ 2.2.6, 2.4.3, 4.1). This natural gas system represents a resource of considerable capacity and offers access to adequate supplies of gas from the Rocky Mountains, Canada, and the Southwest. Staff agrees with the applicant's prediction that there would be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

GWF Tracy would obtain raw water from the Byron Bethany Irrigation District, supplied by the Delta-Mendota Canal, and treat the raw water on the project site to suit project

needs for combustion turbine evaporative coolers, HRSG makeup, fire protection, and various other plant uses. Bottled water would be supplied for drinking. A 125,000-gallon demineralized water storage tank would allow the plant to continue operating in case of an interrupt in water supply (GWF 2008a, AFC §§ 2.2.7, 2.4.2.3, 2.4.4). Water usage would be minimized by employing an air-cooled condenser as the ultimate heat sink and a near-zero waste water discharge system (GWF 2008a, AFC §§ 5.15.3.4). Staff believes these sources, combined with the on-site storage capacity, 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, tsunamis (tidal waves), seiches (waves in inland bodies of water), and flooding would not likely represent a hazard for this project, but seismic shaking (earthquake) may present a credible threat to reliable operation.

Seismic Shaking

The site lies within Seismic Zone 4 (GWF 2008a, AFC Appendix 1, § 2.3.1); see the "Faulting and Seismicity" portion of the **GEOLOGY AND PALEONTOLOGY** section of this document. The project would be designed and constructed to the latest appropriate LORS (GWF 2008a, AFC §§ 5.4.3.4, 5.4.4.2). 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.

Flooding

The site does not receive storm water runoff from off site and is not within a 100- or 500-year flood zone (GWF 2008a, AFC Appendix 1 § 2.3.1). Staff believes there are no concerns with power plant functional reliability due to flooding. For further discussion, see **SOIL AND WATER RESOURCES** and **GEOLOGY AND PALEONTOLOGY**.

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 Corporation (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 statistic for the years 1999 through 2003 (NERC 2005):

For combined cycle units (All MW sizes):

Availability Factor = 89.00%

The gas turbines that would be employed in the project, General Electric frame 7EA turbines, have been on the market for more than two decades and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor of 92-98% (GWF 2008a, AFC § 2.4.1) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these 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 would 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.

NOTEWORTHY PROJECT BENEFITS

The applicant proposes to enhance power supply reliability in the California electricity market by meeting the needs of the state's energy demand and contributing to the electricity reserves in the region. The fact that the project consists of two combustion turbine generators configured as independent equipment trains provides inherent reliability. A single equipment failure cannot disable more than one train, thus allowing the plant to continue to generate (at reduced output).

The gas turbines that would be employed in the project have been on the market for many years and can be expected to exhibit typically high availability. The applicant's prediction of an equivalent availability factor of 92-98% appears achievable. Staff believes this should provide an adequate level of reliability.

CONCLUSION

GWF predicts an equivalent availability factor of 92-98%, which staff believes is achievable. Based on a review of the proposal, staff concludes that the plant would 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.

AGENCY AND PUBLIC COMMENTS

No agency or public comments were received regarding project efficiency.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

GWF 2008a. GWF Energy LLC/D. Wheeler (tn: 47105). Application for Certification for GWF Tracy Combined Cycle Power Plant Project, dated 7/10/2008. Submitted to California Energy Commission Docket Unit on 7/18/2008.

McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. *Operational Experience in Competitive Electric Generation*, executive report.

NERC 2005. North American Electric Reliability Council. *1999–2003 Generating Availability Report.*

TRANSMISSION SYSTEM ENGINEERING

Testimony of Ajoy Guha, P. E. and Mark Hesters

SUMMARY OF CONCLUSIONS

The proposed interconnection facilities for the GWF Tracy Combined Cycle Power Plant project (GWF Tracy) including the proposed 115 kV overhead line between the new generator step-up (GSU) transformer and the existing GWF Tracy 115 kV switchyard, modifications and/or upgrades in the existing GWF Tracy 115 kV switchyard and Pacific Gas & Electric (PG&E) Schulte 115 kV switching station, and reconductoring the existing generator tie line from the GWF Tracy switchyard to the Schulte switching station would be adequate in accordance with industry standards and good utility practices, and are acceptable to staff according to engineering Laws, Ordinances, Regulations and Standards (LORS).

The Interconnection System Impact Restudy (ISIR)/Interconnection Facilities study (IFAS) report demonstrates that the GWF Tracy 145 MW generation output would not cause any new normal (N-0) overloads or voltage violations in the PG&E network for the 2013 seasonal system conditions studied. However, under certain emergency contingency conditions GWF Tracy causes new overloads and increases pre-project overloads on some downstream PG&E facilities. The mitigation plan is adequate to eliminate the adverse impacts. The mitigation options to eliminate new overloads include Special Protection System (SPS) for reducing GWF Tracy generation output and downstream network upgrades including upgrades of Schulte 115 kV switching station and reconductoring the 2.5-mile Cross Road-Kasson Jct. 2 section of the Vierra-Tracy-Kasson 115 kV line with higher size conductor.

The Schulte-Lammers 115 kV line Category B (L-1 & G-1) contingency overload is a pre- project overload. PG&E would reconductor the overloaded Schulte-Owens Tap 1 line section of the line in 2009 as part of PG&E project T680B (Tesla Area Reconductoring Project) in their annual transmission plan. Reconductoring the line section is not a part of the GWF Tracy and is, therefore, considered beyond the scope of Energy's Commission's California Environmental Quality Act (CEQA) review for indirect impacts.

The California System Operator (California ISO) instead of issuing a final approval letter would proceed to execute Large Generator Interconnection Agreement (LGIA) between the California ISO and the project owner, and subsequently perform an Operational study/procedure examining the impacts of the GWF Tracy on the PG&E system based on the expected April, 2013 commercial operation date (COD). The GWF Tracy would, therefore, conform to applicable LORS upon satisfactory compliance of the recommended Conditions of Certification.

The GWF Tracy would utilize the existing TPP infrastructure to reduce environmental impacts and costs. The GWF Tracy, as local generation, would meet the increasing load demands in the San Joaquin County and City of Tracy, provide additional reactive power and voltage support, enhance reliability and may reduce system losses in the PG&E local network.

INTRODUCTION

The Transmission System Engineering (TSE) analysis examines whether or not the facilities associated with the proposed interconnection conforms to all applicable LORS required for safe and reliable electric power transmission. Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant. Additionally, under the 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 the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that are required for interconnection and represent the "whole of the action." The downstream network upgrade mitigation measures that will be required to maintain system reliability for the addition of the power plant, are used to identify the requirement for any additional CEQA analysis.

Energy Commission staff relies on the interconnecting authority for the analysis of impacts on the transmission grid as well as the identification and approval of required new or modified facilities downstream from the proposed interconnection that would be required as mitigation measures. The proposed GWF Tracy would interconnect to the PG&E transmission network and requires analysis by PG&E and approval of the California ISO.

PG&E'S ROLE

PG&E is responsible for ensuring electric system reliability in the PG&E system for addition of the proposed generating plant. PG&E will provide the analysis and reports in their System Impact and Facilities studies, and their approval for the facilities and changes required in the PG&E system for addition of the proposed transmission modifications.

CALIFORNIA ISO'S ROLE

The California ISO is responsible for ensuring electric system reliability for all participating transmission owners and is also responsible for developing the standards necessary to achieve system reliability. The California ISO is responsible for completing the studies of the PG&E system to ensure adequacy of the proposed transmission interconnection. The California ISO will determine the reliability impacts of the proposed transmission modifications on the PG&E transmission system in accordance with all applicable reliability criteria. According to the California ISO Tariffs, the California ISO will determine the "Need" for transmission additions or upgrades downstream from the interconnection point to insure reliability of the transmission grid. The California ISO will, therefore, review the System Impact Study (SIS) performed by PG&E and/or any third party, provide their analysis, conclusions and recommendations. On satisfactory completion of the PG&E Facility study and in accordance with the Large Generator Interconnection Procedure (LGIP) as in the California ISO Tariff, the California ISO instead of issuing a final approval letter, would proceed to execute LGIA between the California ISO and the project owner and subsequently perform an Operational study examining the impacts of the project on the grid based on the expected April 1, 2013

commercial operation date (COD). The California ISO may also provide written and verbal testimony on their findings at the Energy Commission hearings, if necessary.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

- 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 and 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.
- The National Electric Safety Code, 1999 provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.
- NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for 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 and WECC Planning Standards with Table I and WECC Disturbance-Performance Table” and on Section I.D, “NERC and 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 along a common 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 (WECC 2006).

- North American Reliability Council (NERC) Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC Standards are either more stringent or more specific than the NERC Standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).
- California ISO Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the California ISO transmission grid facilities. The California ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to the NERC/WECC or NERC Reliability Planning Standards for Transmission System Contingency Performance. However, the California ISO Standards also provide some additional requirements that are not found in the WECC/NERC or NERC Standards. The California ISO Standards apply to all participating transmission owners interconnecting to the California ISO controlled grid. They also apply when there are any impacts to the California ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the California ISO (California ISO 2002a).
- California ISO/FERC Electric Tariff provides guidelines for construction of all transmission additions/upgrades (projects) within the California ISO controlled grid. The California ISO determines the “Need” for the proposed project where it will promote economic efficiency or maintain system reliability. The California ISO also determines the Cost Responsibility of the proposed project and provides an Operational Review of all facilities that are to be connected to the California ISO grid (California ISO 2007a).

PROJECT DESCRIPTION

The GWF Tracy would be located in a 16.38-acre site within the existing 40-acre property owned by GWF Energy LLC (GWF) in rural San Joaquin County immediately southwest of the City of Tracy. The existing Tracy Peaker project (TPP) plant owned by the applicant has two natural gas-fired simple-cycle combustion turbine generator (CTG) units with a total 169 MW nominal output. GWF proposes to modify the existing TPP plant by converting the facility into a combined-cycle power plant with a nominal 145 MW net additional generation output. The new steam generating (STG) unit rated 184 MVA, 18 kV would be connected through a 7,000-ampere segregated bus duct and a 7,000-ampere, 18 kV breaker to the low voltage terminal of a dedicated 190 MVA, 18/115 kV GSU transformer with a specified impedance of 8.70% @190 MVA (GWF2008a, AFC, section 3.2.2; GWF2008d, Appendix 3A, SIS, section 3, page 5).

INTERCONNECTION FACILITIES AND GFW TRACY SWITCHYARD MODIFICATIONS

The existing GWF Tracy 115 kV switchyard (ex-TPP switchyard) has a 2,000-ampere single bus arrangement with two 2,000-ampere circuit breakers and a 2,000-ampere disconnect switch. The existing two 84.4 MW CTG units are connected to the switchyard through the circuit breakers and the existing generator overhead tie line to the PG&E Schulte switching station is connected to the switchyard through the disconnect switch.

The high voltage terminals of the proposed GSU transformer for the new STG unit would be connected to the existing GWF Tracy 115 kV switchyard via a new 285-foot 115 kV overhead line, a 2,000-ampere SF6 circuit breaker and associated three 2,000-ampere disconnect switches. The new breaker and two disconnect switches would be located in the fenced area adjacent to the new GSU transformer for the proposed STG unit. The short overhead line would be built by using single 954 kcmil ACSR conductor with vertical configuration on 70-foot high dead-end tubular steel pole structures. The GWF Tracy switchyard bus would be extended to facilitate termination of the new line through a 2,000-ampere new disconnect switch (GWF2008a, AFC, section 3.2.2, page 3-2, Figures 2.1-4 & TSE-1b).

SCHULTE SWITCHING STATION UPGRADES

The existing PG&E 115 kV Schulte switching station is on the east side of the GWF Tracy site. The switching station has a 3,000-ampere ring bus system with three 2,000-ampere circuit breakers and associated disconnect switches suitable for terminating three lines with three switch bays. The existing generator tie line between the GWF Tracy switchyard and the PG&E Schulte switching station is terminated to the switching station through a 2,000-ampere switch bay. The other two switch bays are used for looping the PG&E Tesla-Kasson 115 kV line.

In order to accommodate the proposed 145 MW new generation output from the GWF Tracy, the following reliability upgrades are proposed:

1. The existing ring bus system at the PG&E Schulte switching station would be converted to a 3,000-ampere double bus configuration with three switch bays (includes two new switch bays) with one and a half 2,000-ampere breaker arrangement and associated disconnect switches suitable for terminating six lines. The switching station 115 kV bus would be extended and five new 2,000-ampere breakers with ten 2,000-ampere disconnect switches would be installed.

2. A new switch bay with three 2,000-ampere breakers for two outgoing lines would be used for looping the PG&E Tesla-Manteca 115 kV line through the switching station. The loop lines would be about 1000-foot long and be built on about 50-foot high dead-end pole structures.

3. Reconductoring the existing 716-foot generator overhead 115 kV tie line between the GWF Tracy switchyard and the PG&E Schulte switching station with single 1,431 kcmil ACSS conductor with vertical configuration on the existing 70-foot high dead-end pole structures. The termination facilities at both ends would remain unchanged.

GWF would build the proposed interconnection facilities for the new STG unit, and do modifications of the GWF Tracy 115 kV switchyard, and reconductoring of the existing generator tie line, and own and operate the facilities. PG&E would build the proposed upgrades in the Schulte 115 kV switching station, and own and operate the switching station (CH2M2008c, Figures TSE-1b & TSE-1c).

The proposed interconnection facilities for the new STG unit, modifications/upgrades in the existing GWF Tracy 115 kV switchyard (ex-TPP switchyard) and PG&E Schulte 115 kV switching station, and reconductoring the existing generator tie line from the GWF Tracy switchyard to the PG&E Schulte switching station would be adequate in accordance with industry standards and good utility practices, and are acceptable to staff. Proposed Conditions of Certification TSE 1 to TSE 8 insure that the proposed facilities are designed, built and operated in accordance with good utility practices and applicable LORS.

TRANSMISSION SYSTEM IMPACT ANALYSIS

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility and the control area operator are responsible for ensuring grid reliability. For the GWF Tracy, PG&E and California ISO are responsible for ensuring grid reliability. In accordance with the FERC/California ISO/Utility Tariffs, System Impact and Facilities Studies are conducted to determine the preferred and alternate interconnection methods to the grid, the downstream transmission system impacts and the mitigation measures needed to ensure system conformance with performance levels required by the utility reliability criteria, NERC planning standards, WECC reliability criteria, and California ISO reliability criteria. Staff relies on the studies and any review conducted by the responsible agencies to determine the effect of the project on the transmission grid and to identify any necessary downstream facilities or indirect project impacts required to bring the transmission network into compliance with applicable reliability standards (NERC2006, WECC 2006, California ISO 2002a and 2007a).

The System Impact and Facilities Studies analyze the grid with and without the proposed project under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds by which grid reliability is determined. The studies must analyze the impact of the project for the proposed first year of operation and thus are based on a forecast of loads, generation and transmission. Load forecasts are developed by the interconnected utility, which would be PG&E in this case. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages), and short circuit duties.

If the studies show that the interconnection of the project causes the grid to be out of compliance with reliability standards, the study will then identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. If the interconnecting utility determines that the only feasible mitigation includes

transmission modifications or additions which require CEQA review as part of the "whole of the action," the Energy Commission must analyze those modifications or additions according to CEQA requirements.

SCOPE OF SYSTEM IMPACT STUDY (SIS) AND INTERCONNECTION FACILITIES STUDY

The May 19, 2008 SIS was prepared by the California ISO in coordination with PG&E. Based on the Generator Interconnection Process Reform (GIPR) the SIS base cases included some higher queue generation projects that were placed in 'Transition Cluster' to be evaluated as a group starting in November, 2008. The SIS was derived from the PG&E's 2007 base case series and was prepared with and without the GWF Tracy 145 MW generation output based on the expected April 1, 2013 COD (GWF2008d, Appendix 3A, SIS).

- A 2013 summer peak base case developed from PG&E 2007 base case series and has 1-in -10 year extreme weather load level for the central valley area.
- A 2013 summer off-peak base case with the load in the central valley area at 30-35% of the summer peak load level and rest of the PG&E system are modeled with 2013 spring peak loads.
- A 2013 spring peak base case developed the load in the greater central valley area at 50%of the summer peak load level and high hydro generation available.

The study included analyses for power flow, short circuit, substation evaluation, transient stability, and reactive power deficiency.

The April 17, 2009 Interconnection System Impact Restudy (ISIR)/Interconnection Facilities study (IFAS) performed by California ISO in coordination with PG&E was performed after removing higher queue projects in 'Transition Cluster' from the SIS base cases for evaluation of impacts of GWF Tracy only on the PG&E transmission system. In order to expedite the interconnection study, the ISIR was also combined with the IFAS.

In each of the cases northern California generation and critical seasonal power flows in WECC Paths were maintained within limits. Each of the cases included planned California ISO approved transmission upgrades that would be operational by 2013 and all queue generation higher than the GWF Tracy. However, some generation projects that are electrically far from GWF Tracy are either turned off or modeled with reduced generation to balance loads and resources.

The combined ISIR/IFAS report provides updated power flow analysis results, and work scope and cost estimates for the interconnection facilities including upgrades in the Schulte switching station and downstream network reliability upgrades in the PG&E system, assuming PG&E would engineer, construct, own and maintain the Schulte switching station and downstream network upgrades (CH2M2009d, ISIR/IFAS report; GWF 2009c, Appendices).

POWER FLOW STUDY RESULTS AND MITIGATION

The ISIR/IFAS indicates that the GWF Tracy generation output would not cause any new normal (N-0) overloads or voltage violations in the PG&E network for the 2013 seasonal system conditions studied. However, under certain emergency contingency conditions the GWF Tracy causes new overloads on some downstream PG&E facilities and increases pre-project overloads. The GWF Tracy is responsible for mitigating new overloads. The Power Flow study results are shown in Tables 6.1 to 6.3, Tables 7-1 to 7-3 and sections 6 and 7 of the ISIR/IFAS (CH2M2009d).

The addition of the GWF Tracy exacerbates pre-project overloads (post-project overloads: 103-186%) under normal and/or category B (N-1, L-1 & G-1) or category C (N-2) contingency conditions on the following lines during 2013 different seasonal system conditions:

- Wanerville-Wilson 230 kV line.
- Vierra-Tracy-Kasson 115 kV line (Cross Road Jct.-Tracy section).
- Schulte SW ST-Lammers 115 kV line (Schulte SW ST-Owens tap 1 section).
- Kasson-Louse 60 kV line (Kasson-Mossdale Sw section).
- Kasson 115/60 kV transformer bank #1.
- Manteca-Louse 60 kV line (Louse Jct.-Manteca section).
- Tesla-Salado-Manteca 15 kV line (Manteca-Ingraham Creek section)
- Staff considers the mitigation plan acceptable.
- Tesla-Wesley 230 kV line.

  Mitigation: The ISIR/IFAS determined that the pre-project overloads on these lines are caused by generation projects that have higher position queue position than that of GWF Tracy and earlier on-line dates. Those higher queue projects are responsible for mitigating these overloads. If any of the higher queue projects does not materialize or the mitigation provided does not resolve the overload(s), then the GWF Tracy may be responsible for mitigating the overload(s). Staff considers the mitigation plan acceptable.

  The Schulte SW ST-Lammers 115 kV line Category B (L-1 & G-1) contingency overload during 2013 summer peak system conditions is also a pre-project overload and PG&E identified overloads on this line in their planning process regardless of whether the GWF Tracy project is built. As part of PG&E project T680B (Tesla Area Reconductoring Project) in their annual transmission plan, PG&E will reconductor the overloaded Schulte SW ST-Owens Tap 1 section of the line in 2009. Reconductoring the line section, therefore, is not a part of the GWF Tracy and considered beyond the scope of Energy Commission's CEQA review for downstream indirect impact.

The ISIR/IFAS identified the following new overloads due to the addition of the proposed GWF Tracy under certain contingencies and corresponding mitigation measures:

- Vierra-Tracy-Kasson 115 kV line (Cross Road-Kasson Jct. 2 section): The line loading increases from 97-104% of its emergency rating during 2013 summer peak system conditions under category B (L-1 & G-1) contingency of the Schulte SW St-Kasson-Manteca 115 kV line and the Stanislaus Powerhouse.

  Mitigation: Reconductoring the 2.5-mile section of the line with 477 kcmil Aluminum steel-supported (ACSS) or equivalent conductor along with upgrading the existing substation terminal equipment of the line to match the new current rating. Staff considers the mitigation acceptable.

- Schulte SW ST-Kasson-Manteca 115 kV line (Kasson Jct.-Schulte section): The loading on the line increases from 74-103% of its emergency rating during 2013 summer peak system conditions due to category B (N-1) contingency of the Schulte ST ST-Lammers 115 kV line.

  Mitigation: Preferred mitigation is identified as installing a Special Protection System (SPS) to reduce GWF Tracy generation to 125 MW or lower under specific contingency conditions, since the line conductor 477 ACSS was not found suitable for higher ampere re-rating at 4 ft/sec wind speed. An alternative mitigation option would be to reconductor the 8.9-mile section of the line along with upgrades of substation terminal equipment. Staff considers the preferred, SPS, mitigation acceptable.

SHORT CIRCUIT STUDY RESULTS AND SUBSTATION EVALUATION

Three line-to-ground and single line-to-ground faults were simulated with and without the GWF Tracy to determine if there are any overstressed circuit breakers in PG&E substations in the project vicinity caused by the addition of the project. The short circuit results are shown in Table 7-1 in section 7-2 of the SIS and substation evaluation provided in section 11 of the SIS (GWF2008d, Appendix 3A, SIS, sections 7 & 11).

Using the short study results, a substation breaker evaluation determined that there would be no circuit breaker fault duty violation caused by the addition of the GWF Tracy.

TRANSIENT STABILITY STUDY RESULTS

Transient stability analysis is performed to determine whether the transmission system would remain stable with the addition of the GWF Tracy. The analysis was performed with the 2013 summer peak system conditions with simulated faults under selected critical category B & C contingencies. The SIS results concluded that the GWF Tracy would have no adverse impact and the transmission system would remain stable with the addition of the GWF Tracy for all contingency simulations studied. The transient stability plots are shown in Appendix F of the SIS (GFW2008d, Appendix 3A, SIS, section 10).

REACTIVE POWER DEFICIENCY ANALYSIS RESULTS

The power flow studies with category B and C contingencies indicate that the GWF Tracy would not cause voltage drops of 5% or more from the pre-project levels and would meet the applicable voltage criteria in the PG&E system (GWF2008d, Appendix 3A, SIS, section 9).

CALIFORNIA ISO REVIEW

In accordance with the provisions of LGIP as in the California ISO Tariff, the May19, 2008 SIS was prepared by the California ISO in coordination with PG&E to evaluate the impact of the proposed 145 MW generation output from the GWF Tracy to the existing Schulte 115 kV switching station. The SIS indicates that in order for PG&E to get exemption from the California Public Utility Commission's (CPUC) GO 131-D permit and expedite the process to proceed early for construction of the network upgrades, the applicant has the option as a part of their AFC to submit an environmental analysis report with a mitigation plan to the Energy Commission to meet requirements of the CEQA review for scope of work for the network upgrades. A finding of no significant or unmitigated environmental impacts in the CEQA process will allow PG&E to file an advice letter with the CPUC for an expedited CPUC permit (GWF2008d, Appendix 3A, SIS).

The April 17, 2009 ISIR/IFAS was performed by the California ISO and PG&E, power flow analysis for interconnection of GWF Tracy was revised. In accordance with the LGIP as in the California ISO Tariff, the California ISO instead of issuing a final approval letter, would proceed to execute a LGIA between the California ISO and the project owner, and subsequently perform an Operational study/procedure examining the impacts of the GWF Tracy on the grid based on the expected April 1, 2013 COD. The California ISO may also provide written and verbal testimony on their findings at the Energy Commission hearings, if necessary.

Performance of the Operational study/procedure based on 2013 COD and execution of the LGIA would ensure system reliability in the California ISO grid and compliance with WECC/NERC and California ISO Planning standards (WECC 2006, NERC 2006, California ISO 2002a and 2007a).

DOWNSTREAM FACILITIES

Besides the proposed interconnection facilities for the proposed GWF Tracy and modifications/upgrades in the existing GWF Tracy 115 kV switchyard and PG&E Schulte 115 kV switching station, and reconductoring the generator tie line from the GWF Tracy switchyard to the PG&E Schulte switching station, accommodating the interconnection of the GWF Tracy new generation output at the Schulte switching station substation would require downstream reliability upgrades at Schulte switching station and reconductoring the Vierra-Tracy-Kasson (2.5-mile Cross Road-Jct. 2 section) 115 kV line. PG&E would do construction for reconductoring the line, which would occur within the existing PG&E right-of-way between the substations with some adjacent temporary laydown and stringing sites.

CUMULATIVE IMPACTS

Since the GWF Tracy, as local generation, is being connected to the rural sparse 115 kV network with long transmission lines and increasing load demand, staff believes that the GWF Tracy generation could create some cumulative effects in the network.

The cumulative impacts due to the GWF Tracy, as identified in the ISIR/IFAS, would be mitigated. Staff also believes that there would be some positive impacts because GWF Tracy, as local generation, would meet the increasing load demand in the San Joaquin County and City of Tracy, provide additional reactive power and voltage support, enhance reliability and may reduce system losses in the PG&E local network.

ALTERNATIVE TRANSMISSION ROUTES

Since the generator 115 kV overhead tie line between the existing GWF Tracy switchyard and the PG&E Schulte 115 kV switching station is already available on site no other alternatives were considered. The short overhead line between the GWF Tracy switchyard and the new GSU transformer would follow the shortest and economic route within the existing GWF property with least infrastructure improvement (GWF2008a, AFC, section 6.5.2).

CONFORMANCE WITH LORS AND CEQA REVIEW

The proposed interconnection facilities for the GWF Tracy, modifications and/or upgrades in the existing GWF Tracy 115 kV switchyard and PG&E Schulte 115 kV switching station, and reconductoring the existing generator tie line from the GFW Tracy switchyard to the PG&E Schulte switching station would be adequate in accordance with industry standards and good utility practices, and are acceptable to staff.

The ISIR/IFAS demonstrates that there would be some adverse impacts on the PG&E system for the addition of the GWF Tracy to the Schulte 115 kV switching station. The mitigation plan according to the ISIR/IFAS report would be adequate to eliminate the adverse impacts of new overloads and pre-project overloads.

The GWF Tracy would meet the requirements and standards of all applicable LORS upon satisfactory compliance of the proposed TSE Conditions of Certification.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No agency or public comments related to the TSE discipline have been received.

CONCLUSIONS AND RECOMMENDATIONS

1. The proposed interconnection facilities for the GWF Tracy including the proposed short 115 kV overhead line between the new GSU transformer and the existing GWF Tracy 115 kV switchyard (ex-TPP switchyard), modifications and/or upgrades in the existing GWF Tracy 115 kV switchyard and PG&E Schulte 115 kV switching station, and reconductoring the existing generator tie line from the GWF Tracy switchyard to

the Schulte switching station would be built according to the NESC standards and GO-95 Rules. The new facilities, and modifications and/or upgrades would be adequate in accordance with industry standards and good utility practices, and are acceptable to staff according to engineering LORS.

2. The ISIR/IFAS demonstrates that the GWF Tracy 145 MW generation output would not cause any new normal (N-0) overloads or voltage violations in the PG&E network for the 2013 seasonal system conditions studied. However, under certain emergency contingency conditions the GWF Tracy causes new overloads and increases pre-project overloads on some downstream PG&E facilities. The mitigation plan according to the ISIR/IFAS report is adequate to eliminate the adverse impacts. The GWF Tracy is responsible for mitigating the new overloads. The mitigation options to eliminate new overloads include Special Protection System (SPS) for reducing GWF Tracy generation output by about 25 MW and downstream network upgrades including upgrades of Schulte 115 kV switching station and reconductoring 2.5-mile Cross Road-Kasson Jct. 2 section of the Vierra-Tracy-Kasson 115 kV line with 477 ACSS conductor.

3. The ISIR/IFAS determines that the pre-project downstream overloads on eight lines are caused by generation projects that have higher position queue position than that of GWF Tracy and earlier on-line dates. Those higher queue projects are responsible for mitigating these overloads. GWF Tracy is not, therefore, responsible to mitigate these pre-project overloads. Staff considers the mitigation plan acceptable.

   <u>The Schulte SW ST-Lammers 115 kV line</u> Category B (L-1 & G-1) contingency overload during 2013 summer peak system conditions is also a pre-project overload. As part of PG&E project T680B (Tesla Area Reconductoring Project) in their annual transmission plan, PG&E will reconductor the overloaded Schulte SW ST-Owens Tap 1 section of the line in 2009. Reconductoring the line section, therefore, is not a part of the GWF Tracy and is considered beyond the scope of Energy Commission's CEQA review for downstream indirect impacts.

4. The California ISO instead of issuing a final approval letter would proceed to execute LGIA between the California ISO and the project owner, and subsequently perform an Operational study/procedure examining the impacts of the GWF Tracy on the grid based on the expected April, 2013 COD.

5. The GWF Tracy would conform to applicable LORS upon satisfactory compliance of the recommended Conditions of Certifications.

6. GWF Tracy would utilize the existing TPP infrastructure to reduce environmental impacts and costs. GWF Tracy, as local generation, would meet the increasing load demands in the San Joaquin County and City of Tracy, provide additional reactive power and voltage support, enhance reliability and may reduce system losses in the PG&E local network.

RECOMMENDATIONS

If the Energy Commission approves the project, staff recommends the following Conditions of Certification to ensure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATIONS 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.

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects and Wave-traps
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Insulators and Conductors
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.

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.

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.

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 to the CBO 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", California ISO standards, National Electric Code (NEC) and related industry standards.

B. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to accommodate full output from the project and 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 PG&E interconnection standards.

F. The project owner shall provide to the CPM:

1. The Special Protection System (SPS) sequencing and timing if applicable,

2. A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation are acceptable,

3. The Operational study report based on April 1, 2013 or current Commercial Operation Date (COD) system conditions from the California ISO and/or PG&E, and

4. A copy of the executed LGIA signed by the California ISO and the project owner.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser 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.

[1] Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

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 Special Protection System (SPS) sequencing and timing if applicable shall be provided concurrently to the CPM.

E. A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation are acceptable.

F. The Operational study report based on April 1, 2013 or current Commercial Operation Date (COD) system conditions from the California ISO and/or PG&E, and

G. A copy of the executed LGIA signed by the California ISO and the project owner.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes that may not conform to 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 that` may not conform to requirements of **TSE-5** and request approval to implement such changes.

TSE-7 The project owner shall provide the following Notice to the California Independent System Operator (California 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 California 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 California ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. The project owner shall contact the California 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 California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

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".

C. A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

REFERENCES

California ISO (California Independent System Operator) 1998a. California ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

California ISO (California Independent System Operator) 1998b. California ISO Dispatch Protocol posted April 1998.

California ISO (California Independent System Operator) 2002a. California ISO Planning Standards, February 7, 2002.

California ISO (California Independent System Operator) 2007a. California ISO, FERC Electric Tariff, First Replacement Vol. No. 1, March, 2007.

GWF2008a: GWF Energy LLC/D. Wheeler. Application for Certification (AFC) for the GWF Tracy. Submitted on 7-18-2008.

GWF2008d: Appendix 3A, System Impact Study Report dated May 19, 2008. Submitted on 7-18-2008.

GWF2008c: Appendix 3A, Appendices to ISIR/IFAS. Submitted on 7-23-2009.

CH2M2009d: Interconnection System Impact Restudy/Interconnection Facilities Study Report dated April 17, 2009 from California ISO. Submitted on 6-15-2009.

CH2M 2008c: Response to Data Adequacy review, dated September, 2008. Submitted on 9-5-2008.

CH2M2008d: Email for the TSE reconductoring and segment References dated 1-14-09. Submitted on 1-14-09.

Avenal Power 2008i: System Impact Study supplemental report dated November 11, 2008 for the Avenal Energy interconnection performed by NCI. Submitted on November 12, 2008 2008.

NERC (North American Electric Reliability Council) 2006. Reliability Standards for the Bulk Electric Systems of North America, May 2 2006.

WECC (Western Electricity Coordinating Council) 2006. NERC/WECC Planning Standards, August 2006.

DEFINITION OF TERMS

ACSR	Aluminum cable steel reinforced.
AAC	All Aluminum conductor.
ACSS	Aluminum conductor steel-supported.
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.
Kiloampere (kA)	1,000 Amperes
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	Congestion management is a scheduling protocol, which provides that
Management	dispatched generation and transmission loading (imports) would not violate criteria.
Emergency Overload	See Single Contingency. This is also called an L-1.
Hertz	The unit for System Frequency.
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. 1,000 Volts.
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.
MVAR or	Megavolt Ampere-Reactive. One million Volt-Ampere-Reactive.

Megavars	Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.
Megavolt	A unit of apparent power, equals the product of the line voltage
Ampere (MVA)	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 inductive loads like 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	A remedial action scheme is an automatic control provision,
Scheme (RAS)	which, for instance, would trip a selected generating unit upon a circuit overload.
SSAC	Steel Supported Aluminum Conductor.
SF6	Sulfur hexafluoride is an insulating medium.
Single	Also known as emergency or N-1 condition, occurs when one
Contingency	major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.
Solid Dielectric	Copper or aluminum conductors that are insulated by solid
Cable	polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

SVC	Static VAR Compensator: An equipment made of Capacitors and Reactors with electronic controls for producing and controlling Reactive Power in the Power System.
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.
TRV	Transient Recovery Voltage
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.
VAR	Voltage Ampere Reactive, a measure for Reactive power in the power system.

ALTERNATIVES

Testimony of Alan Solomon

SUMMARY OF CONCLUSIONS

The proposed project would modify the existing Tracy Peaker Plant simple-cycle power plant by converting the facility into a combined-cycle power plant. The conversion would make use of Tracy Peaker Plant's existing infrastructure to reduce environmental impacts and costs. Staff recommends that the Energy Commission find that the proposed project has a strong relationship to the existing industrial site and not require the analysis of alternative sites.

Alternative generation technologies (i.e. solar, wind, and biomass) were analyzed as possible alternatives to the project. Staff determined that none of the technologies were feasible or met most of the basic objectives of the project. Solar and wind were eliminated for consideration, because the impacts to agricultural land could be much greater than the proposed project. Current biomass generation is not a viable option because of the significant environmental impacts related to a facility capable of providing the same amount of energy as the proposed project.

INTRODUCTION

This section considers potential alternatives to the construction and operation of the proposed GWF Tracy Combined Cycle Power Plant (GWF Tracy). The purpose of this section is to provide an analysis of a reasonable range of feasible alternatives which could substantially 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). This section identifies potentially significant impacts of the proposed project and analyzes different technologies that may reduce or avoid significant impacts. Staff has also analyzed the impacts that may be created by alternative technologies.

DETERMINING THE SCOPE OF THE ALTERNATIVES ANALYSIS

The Guidelines for Implementation of the California Environmental Quality Act, Title 14, California Code of Regulations, section 15126.6(a), provides direction for scoping the alternatives analysis by requiring an evaluation of alternatives based upon 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 a reasoned choice. Further, the potentially feasible alternatives shall be selected and discussed to foster informed decision making and public participation. The CEQA guidelines state that an environmental document does not have to consider an alternative where the effect

cannot be reasonably ascertained and whose implementation is remote and speculative (Cal. Code Regs., tit. 14, §15126.6 (f) (3)). To prepare the alternatives analysis, staff used the methodology summarized below:

- Identify the basic project objectives.
- Identify the proposed project's significant adverse environmental impacts.
- Identify the project's relationship to the existing site.
- Evaluate and determine if an alternative site is feasible.
- Evaluate and determine whether any alternative energy generation technologies are feasible project alternatives.
- Consider the "No Project" alternative.
- Conclude whether or not an alternative site and/or a different technology is feasible and will yield less of an environmental impact than the proposed project. Include a recommendation based on the evidence.

BASIC OBJECTIVES OF THE PROJECT

After studying GWF Energy's AFC, Energy Commission staff has determined that GWF Tracy project's objectives are to:

- Meet the expanding need for efficient and reliable electrical generating resources located in the load center of the San Joaquin County and City of Tracy region;
- Accomplish "brownfield" redevelopment and expansion of an existing power plant for a net increase in electrical generation to support electrical system and local resource supply requirements in San Joaquin County and the City of Tracy. This will help meet reliability need and complies with the California Public Utility Commission (CPUC) stated preference for "brownfield" power projects pursuant to Decision No. 04-12-048;
- Provide additional electrical capacity in the San Joaquin County and City of Tracy area while reducing emissions of greenhouse gases through more efficient electrical generation; and
- Convert an existing simple cycle facility to a combined cycle facility using existing TPP infrastructure to reduce environmental impacts and costs.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT

Energy Commission staff has determined that potentially significant impacts can be mitigated by implementation of the conditions of certification identified in the FSA. Potentially significant impacts that can be mitigated include impacts to Air Quality, Land Use, and Biological Resources). In the case of Air Quality, the applicant has proposed emission reduction credits (ERCs) to fully offset all non-attainment pollutants and their precursors at a minimum ratio of one-to-one to reduce impacts to less than significant. In the Land Use section, staff has proposed mitigation to compensate for the permanent

loss of 3.28 acres of Prime Farmland resulting from the project. For Biological Resources, construction-related impacts for GWF Tracy would occur on the same 34.6 acres that were impacted (and mitigated) during construction of the TPP; thus GWF Tracy would not require additional mitigation for habitat loss. Other impacts to special-status species associated with GWF Tracy, beyond temporary and permanent habitat loss, include potential loss of dens in laydown and parking areas, disturbance to breeding or nesting animals in habitats adjacent to laydown and parking areas, impacts of construction noise and night lighting, and disturbance to nesting birds in riparian zones along Segment 3 of the existing transmission line to be reconductored.

For a more detailed review of potential impacts, see staff's technical analyses in the FSA.

PROJECT'S RELATIONSHIP TO THE EXISTING SITE

GWF proposes to modify the existing TPP (01-AFC-16), a nominal 169-megawatt (MW) simple-cycle power plant by converting the facility into a combined-cycle power plant with a new nominal generating capacity of 314 MW. The proposed project would occupy the same site as the existing TPP site, an existing brown-field site, within an industrial and agricultural area which allows electrical generation (County Zoning Designation G-40).

The proposed project would include the addition of two heat recovery steam generators, a steam turbine generator, an auxiliary boiler, an air-cooled dry condenser unit, and a 115-kilovolt (kV) electrical switchyard. The proposed modification would include physically connecting the heat recovery steam generator to the existing TPP power block.

In addition, the proposed project would use existing TPP infrastructure, including the natural gas pipeline, water supply pipeline, and electric transmission line.

SITE ALTERNATIVES

CEQA Guidelines, section 15126.6 (f)(2)(A) states: "The key question and first step in analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR."

For the original TPP, three sites were considered and rejected during the original siting process. If an alternative site were used for the proposed GWF Tracy project then an additional 145 MW peaking facility would have to be built at a new location. This would have potential impacts to air quality, biological resources, public health, land use, and water resources; all of which would require mitigation likely greater than at the proposed site.

Key points when considering alternative sites:

- The original TPP was built on a 40-acre parcel and the project converted 10.3 acres of agricultural land. The proposed GWF Tracy project would convert an additional 3.28 acres of agricultural land. If an alternative site were used, then acreage in excess of the proposed 3.28 acres would have to be converted for the placement of a new facility. Converting this additional land would likely require additional mitigation for biological resources and land use.
- If an alternative site were used, then additional water resources would have to be provided to the new facility.
- A combined-cycle plant uses the same amount of natural gas as a simple cycle plant. If an alternative site were used, then the new facility would have to use additional natural gas resources.
- With the exception of the reconductoring segments and a retention pond, most of the work would be done at the current TPP site, thereby minimizing impact to biological resources and land use.

SITE ALTERNATIVES CONCLUSION

Based on the facts and analysis above, staff has determined that: 1) the proposed project makes substantial use of the existing infrastructure which would greatly reduce significant impacts, and 2) the proposed project accomplishes “brownfield” redevelopment and expansion of an existing power plant for a net increase in electrical generation capacity of 145 megawatts (MW). Both of which are objectives of this project.

Given these facts, staff does not believe a detailed reexamination of alternative sites is required for GWF Tracy. This is supported by the Warren-Alquist Act and CEQA.

The Warren-Alquist Act [Public Resource Code 25540.6(b)] provides “that the commission may also accept an application for a noncogeneration project at an existing industrial site without requiring a discussion of site alternatives if the commission finds that the project has a strong relationship to the existing industrial site and that it is therefore reasonable not to analyze alternative sites for the project.” Staff believes that a strong relationship exists between the existing TPP facility and the proposed GWF Tracy project.

CEQA Guidelines, section 15126.6 (f)(2)(A) states, in part, that only locations that would avoid or substantially lessen any of the significant effects of the project need be considered. Staff concludes that, per CEQA Guidelines, section 15126.6 (f)(2)(B); no feasible alternative sites exist.

Therefore, staff has applied the “rule of reason” and determined that a detailed alternative site analysis is not needed.

GENERATION TECHNOLOGY ALTERNATIVES

CONSERVATION AND DEMAND SIDE MANAGEMENT

One alternative to meeting California's electricity demand with new generation is to reduce that demand for electricity. Such "demand side" measures include programs that increase energy efficiency, reduce electricity use, or shift electricity use away from "peak" hours of demand.

In California there is a considerable array of demand side programs. At the federal level, the Department of Energy adopts national standards for appliance efficiency and building standards to reduce the use of energy in federal buildings and at military bases. At the state level, the Energy Commission adopts comprehensive energy efficiency standards for most buildings, appliance standards for specific items not subject to federal appliance standards, and load management standards. The Energy Commission also provides grants for energy efficiency development through the Public Interest Energy Research (PIER) program.

The California Public Utilities Commission, along with the Energy Commission, oversees investor-owned utility demand side management programs financed by the utilities and its ratepayers. At the local level, many municipal utilities administer demand side management and energy conservation programs. These include subsidies for the replacement of older appliances through rebates, building weatherization programs, and peak load management programs. In addition, several local governments have adopted building standards which exceed the state standards for building efficiency, or have by ordinance set retrofit energy efficiency requirements for older buildings. New buildings may combine the need for heat and power through a single fuel source or a common source may supply heating and/or heating and cooling to a number of adjacent buildings, increasing overall efficiency.

Even with this great variety of federal, state, and local demand side management programs, the state's electricity use is still increasing as a result of population growth and business expansion (US Census Bureau).

Therefore, although it is likely that federal, state, and local demand side programs will receive even greater emphasis in the future, both new generation and new transmission facilities will be needed in the immediate future and beyond in order to maintain adequate supplies.

RENEWABLE RESOURCES

Alternative generation technologies were analyzed as possible alternatives to the project. Staff compared various alternative technologies with the proposed project, scaled to meet the project's objectives. Technologies examined were those principal electricity generation technologies which do not burn fossil fuels such as natural gas: solar, wind, and biomass. There are no geothermal resources in the project vicinity, making this technology an infeasible alternative to the GWF Tracy project. Hydroelectric power also does not require burning fossil fuels. In addition to the lack of water sources for hydroelectric power in the project area, this power source can cause significant environmental impacts primarily due to the inundation of many acres of potentially

valuable habitat and the interference with fish movements during their life cycle. It is unlikely that new hydropower facilities could be developed and permitted in California within the next several years.

Both solar and wind generation can be credited with an absence or reduction in air pollutant emissions and need for related controls, and visible plumes. In the case of biomass, however, emissions can be substantially greater. Solar and wind resources require large land areas in order to generate 145 MW of electricity. Specifically, central receiver solar thermal projects require approximately 5 acres per MW; 145 MW would require approximately 725 acres, or 45 times the amount of land area taken by the proposed GWF Tracy project. Parabolic trough solar thermal technology requires similar acreage per MW. Photovoltaic (PV) arrays mounted on buildings generally require about 4 acres per MW. To generate 145 MW using PV panels, about 580 acres would be needed. Wind generation “farms” generally require about 4.5 acres per MW; about 652 acres would be needed to generate 145 MW. Although there is acreage, and specifically acreage that offers some of the specific needs of these renewable resources, available in the project area, the land use impacts and loss of agricultural land could be a significant impact. The need for extensive acreage would also add to the complexities of local discretionary actions for land use modifications and these must also be considered.

While biomass facilities usually use wood chips or other sources from agricultural operations, several companies are developing technologies that would focus on “gasification combustion” to meet the low emission standards mandated by the state. However, traditional biomass plants are typically sized to generate approximately 20 megawatts, (such as the nearby Tracy Biomass plant which generates 21.5 MW) which is far less than the capacity of the proposed 145-MW of additional generating capacity. In order to generate 145 MW, seven 20 MW biomass facilities would be required. A traditional biomass facility would require significantly more land than needed for the expansion of GWF Tracy and several hundred acres could be required for the feedstock. If new biomass technology is developed in the near future, increased energy production could come from landfills in the area, limiting the necessary power from base-load power plants.

Because alternative generation technologies may not be available on demand and would not address the conversion of a simple-cycle peaker plant to the more fuel efficient combined cycle project proposed, they do not fulfill two basic objective of this project: to provide capability to respond to increased regional demands and convert the waste heat from the existing TPP to electrical energy. Additionally, although the proposed project would require 3.28 acres of agricultural land to be converted, this will have less of an impact than converting the hundreds of acres that would have to be converted using one of the technologies detailed above. Consequently, staff does not believe that geothermal, hydroelectric, solar, wind or biomass technologies present feasible alternatives to the proposed project.

THE “NO PROJECT” ALTERNATIVE

The “no project” alternative under CEQA assumes that the 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)). CEQA Guidelines and Energy Commission regulations require consideration of the "no project" alternative. The no-action alternative provides a baseline against which the effects of the proposed action may be compared. In short, the site-specific and direct impacts associated with the power plant would not occur at this site if the project does not go forward.

If the "no project" alternative were selected, the construction and operational impacts of proposed upgrades to the existing TPP would not occur. Without the proposed project, the existing TPP would continue to run as a 169 MW peaking power plant and the additional 145 MW of power in the project area would have to be met by another project.

Staff views the "no project" alternative as feasible. However, if the project is not built, the region will not benefit from the relatively efficient source of 145 MW of power that this facility would provide. This new baseload generation would increase the amount of electrical energy available to the local grid per therm of natural gas consumed. Additionally, the "no project" alternative would eliminate the expected economic benefits that the proposed project would bring to the area, including increased property taxes, employment, sales taxes, and sales of services, manufactured goods, and equipment. Therefore, staff believes that, overall, the "no project" alternative is not the preferred alternative.

CONCLUSIONS AND RECOMMENDATION

Staff has analyzed in detail alternatives to the project design and related facilities, alternative technologies, and the "no project" alternative. Staff did not analyze in detail alternative sites for the project. Staff determined that developing the project at an alternative site would not achieve most of the basic objectives of this project and would not avoid or substantially lessen any of the significant effects of the project.

Staff determined that the proposed project 1) makes substantial use of the existing infrastructure which would greatly reduce significant impacts and 2) accomplishes "brownfield" redevelopment and expansion of an existing power plant for a net increase in electrical generation capacity. Both of which are objectives of this project.

Alternative generation technologies (i.e. solar, wind, and biomass) were analyzed as possible alternatives to the project. Staff determined that none of the technologies were feasible or met the objectives of the project. Solar and wind were eliminated for consideration, because the impacts to agricultural land could be greater than the proposed project. Current biomass generation is not a viable option because of the land use requirements and environmental impacts related to a facility capable of providing the same amount of energy as the proposed project. In addition, the alternative technologies do not meet the important project objective of replacing the existing simple

cycle TPP with a more efficient combined cycle power plant. Therefore, staff does not believe that alternative technologies (geothermal, solar, wind, biomass, hydroelectric) present feasible alternatives to the proposed project.

REFERENCES

GWF 2008a, Application for Certification, GWF Tracy Combined Cycle Power Plant, Tracy, California, July 18, 2008.

US Census Bureau, Website *www.census.gov, (*Population Finder▸California).

GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Angelique Juarez-Garcia

INTRODUCTION

The project's General Compliance Conditions of Certification, 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 public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California 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 of certification;
- Establish requirements for facility closure plans; and
- Specify conditions of certification for each technical area containing the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure below a level of significance. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

DEFINITIONS

The following terms and definitions are used to establish when Conditions of Certification are implemented.

PRE-CONSTRUCTION SITE MOBILIZATION

Site mobilization is limited preconstruction activities at the site to allow for the installation of fencing, construction trailers, construction trailer utilities, and construction trailer parking at the site. Limited ground disturbance, grading, and trenching associated with the above mentioned pre-construction activities is considered part of site mobilization. Walking, driving or parking a passenger vehicle, pickup truck and light vehicles is allowable during site mobilization.

CONSTRUCTION

Onsite work to install permanent equipment or structures for any facility.

Ground Disturbance

Construction-related ground disturbance refers to activities that result in the removal of top soil or vegetation at the site beyond site mobilization needs, and for access roads and linear facilities.

Grading, Boring, and Trenching

Construction-related grading, boring, and trenching refers to activities that result in subsurface soil work at the site and for access roads and linear facilities, e.g., alteration of the topographical features such as leveling, removal of hills or high spots, moving of soil from one area to another, and removal of soil.

Notwithstanding the definitions of ground disturbance, grading, boring and trenching above, construction does **not** include the following:

1. The installation of environmental monitoring equipment;

2. A soil or geological investigation;

3. A topographical survey;

4. Any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; and

5. Any work to provide access to the site for any of the purposes specified in "Construction" 1, 2, 3, or 4 above.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, "commercial operation" begins after the completion of start-up and commissioning, when the power plant has reached reliable steady-state production of electricity at the rated capacity. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

The Compliance Project Manager (CPM) shall oversee the compliance monitoring and is 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 (petition to amend), and ownership or operational control (petition for change of ownership) (See instructions for filing petitions);

4. Documenting and tracking compliance filings; and

5. Ensuring that compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies, Energy Commission, and staff when handling disputes, complaints, and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, the approval will involve all appropriate Energy Commission staff and management. All submittals must include searchable electronic versions (pdf or word files).

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM usually schedules pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings is to assemble both the Energy Commission's and 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. This is to confirm that all applicable conditions of certification have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings 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 the following documents and information as a public record, in either the Compliance file or Dockets 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 of certification changes and the resulting staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

The project owner is responsible for ensuring that the compliance conditions of certification and all other conditions of certification that appear in the Commission Decision are satisfied. The compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, conditions of certification, or ownership. Failure to comply with any of the conditions of certification or the 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 Compliance Conditions of Certification is included as **Compliance Table 1** at the conclusion of this section.

COMPLIANCE CONDITIONS OF CERTIFICATION

Unrestricted Access (COMPLIANCE-1)

The CPM, responsible Energy Commission staff, and delegated agencies or consultants shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on-site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

Compliance Record (COMPLIANCE-2)

The project owner shall maintain project files on-site 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, documents submitted as verification for conditions, and other project-related documents.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this condition.

Compliance Verification Submittals (COMPLIANCE-3)

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by the CPM.

Verification of compliance with the conditions of certification can be accomplished by the following:

1. Monthly and/or annual compliance reports, filed by the project owner or authorized agent, reporting on work done and providing pertinent documentation, as required by the specific conditions of certification;

2. Appropriate letters from delegate agencies verifying compliance;

3. Energy Commission staff audits of project records; and/or

4. Energy Commission staff inspections of work, or other evidence that the requirements are satisfied.

Verification lead times associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter**

subject line shall identify the project by AFC number, the appropriate condition(s) of certification by condition number(s), and 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 and CEC submittal number.

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 hardcopy submittals shall be addressed as follows:

> **Angelique Juarez-Garcia, Compliance Project Manager**
> **(08-AFC-7C)**
> **California Energy Commission**
> **1516 Ninth Street (MS-2000)**
> **Sacramento, CA 95814**

Those submittals shall be accompanied by a searchable electronic copy, on a CD or by e-mail, as agreed upon by the CPM.

If the project owner desires Energy Commission staff action by a specific date, that request shall be made in the submittal cover letter and shall include a detailed explanation of the effects on the project if that date is not met.

Pre-Construction Matrix and Tasks Prior to Start of Construction (COMPLIANCE-4)

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 or prior to the first pre-construction meeting, whichever comes first. It will be submitted in the same format as the compliance matrix described 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 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 development.

If the project owner anticipates commencing project construction as soon as the project is certified, it may be necessary for the project owner to file compliance submittals prior to project certification. Compliance submittals should be completed in advance where

the necessary lead time for a required compliance event extends beyond the date anticipated for start of construction. The project owner must 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 Commission 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 Energy Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

Compliance Matrix (COMPLIANCE-5)

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 conditions of certification 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. If the condition was amended, the date of the amendment.

Satisfied conditions shall be placed at the end of the matrix.

Monthly Compliance Report (COMPLIANCE-6)

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date upon which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include the AFC number and 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 an electronic searchable version 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, as well as the conditions they satisfy and submitted as attachments to the Monthly Compliance Report;

3. An initial, and thereafter updated, compliance matrix showing 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 that 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 submitted to, or permits issued by, other governmental agencies during the month;

8. A projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;

9. A listing of the month's additions to the on-site compliance file; and

10. A listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolution of the resolved actions, and the status of any unresolved actions.

All sections, exhibits, or addendums shall be separated by tabbed dividers or as acceptable by the CPM.

Annual Compliance Report (COMPLIANCE-7)

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 include the AFC number, identify the reporting period and shall contain the following:

1. An updated compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);

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, with the condition it satisfies, and 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 submitted 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 Compliance 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 matters, and the status of any unresolved matters.

Confidential Information (COMPLIANCE-8)

Any information that the project owner deems confidential shall be submitted to the Energy Commission's Dockets Unit 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.

Annual Energy Facility Compliance Fee (COMPLIANCE-9)

Pursuant to the provisions of Section 25806(b) of the Public Resources Code, the project owner is required to pay an annual compliance fee, which is adjusted annually. Current Compliance fee information is available on the Energy Commission's website http://www.energy.ca.gov/siting/filing_fees.html. You may also contact the CPM for the current fee information. The initial payment is due on the date the Energy Commission

adopts the final decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification. The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.

Reporting of Complaints, Notices, and Citations (COMPLIANCE-10)

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 complaints 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 to the CPM of all complaint forms, including noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt. 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 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 implements the on-site contingency plan. It can also include unplanned closure where the project owner fails to implement the contingency plan, and the project is essentially abandoned.

COMPLIANCE CONDITIONS FOR FACILITY CLOSURE

Planned Closure (COMPLIANCE-11)

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 12 months (or other period of time agreed to by the CPM) prior to commencement of closure activities. 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, and local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

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.

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.

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 the Energy Commission approves the facility closure plan.

Unplanned Temporary Closure/On-Site Contingency Plan (COMPLIANCE-12)

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 than 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. (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 12 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).

Unplanned Permanent Closure/On-Site Contingency Plan (COMPLIANCE-13)

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 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.

Post Certification Changes to the Energy Commission Decision: Amendments, Ownership Changes, Staff Approved Project Modifications and Verification Changes (COMPLIANCE-14)

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, and to transfer ownership or operational control of the facility. **It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769.** Implementation of a project modification without first securing Energy Commission, or Energy Commission staff approval, may result in enforcement action that could result in civil penalties in accordance with section 25534 of the Public Resources Code.

A petition is required for **amendments** and for **staff approved project modifications** as specified below. Both shall be filed as a "Petition to Amend." Staff will determine if the change is significant or insignificant. 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 CPM, who will file it with the Energy Commission's Dockets Unit in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below. They reflect the provisions of Section 1769 at the time this condition was drafted. If the Commission's rules regarding amendments are amended, the rules in effect at the time an amendment is requested shall apply.

Amendment

The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, Section 1769(a), when proposing modifications to the project (including linear facilities) design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the final decision, which requires public notice and review of the Energy Commission staff analysis, and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(a). Upon request, the CPM will provide you with a sample petition to use as a template.

Change of Ownership

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process requires public notice and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(b). Upon request, the CPM will provide you with a sample petition to use as a template.

Staff Approved Project Modification

Modifications that do not result in deletions or changes to conditions of certification, that are compliant with laws, ordinances, regulations and standards and will not have significant environmental impacts may be authorized by the CPM as a staff approved project modification pursuant to section 1769(a) (2). This process usually requires minimal time to complete, and it requires a 14-day public review of the Notice of Petition to Amend that includes staff's intention to approve the proposed project modification unless substantive objections are filed. These requests must also be submitted in the form of a "petition to amend" as described above.

Verification Change

A verification may be modified by the CPM without requesting an amendment to the decision if the change does not conflict with the conditions of certification and provides an effective alternate means of verification.

CBO DELEGATION AND AGENCY COOPERATION

In performing construction and operation monitoring of the project, Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Energy Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Energy 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.

Energy Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental protection 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.

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 1237, 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 future law or regulations.

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.

Informal Dispute Resolution Process

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 an informal dispute resolution process. Disputes may pertain to actions or decisions made by any party, including the Energy Commission's delegate agents.

This process may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1237, 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 process 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 brought before the full Energy Commission for consideration via the complaint and investigation procedure.

Request for Informal Investigation

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter. Within seven working days of the CPM's request, provide a written report to the CPM of the results of the investigation, including corrective measures proposed or undertaken. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to also provide an initial verbal report, within 48 hours.

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 proposed or 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 that fairly and accurately identifies the positions of all parties and any understandings 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

Any person may file a complaint with the Energy Commission's Dockets Unit alleging noncompliance with a Commission decision adopted pursuant to Public Resources Code section 25500. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1237.

KEY EVENTS LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

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	
Obtain Building Occupation Permit	
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	

COMPLIANCE TABLE 1
SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-1	Unrestricted Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COMPLIANCE-2	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.
COMPLIANCE-3	Compliance Verification Submittals	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 or the project owner or his agent.
COMPLIANCE-4	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until the 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, • The CPM has issued a letter to the project owner authorizing construction.
COMPLIANCE-5	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.
COMPLIANCE-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 Energy 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.
COMPLIANCE-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.

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-8	Confidential Information	Any information the project owner deems confidential shall be submitted to the Energy Commission's Dockets Unit with a request for confidentiality.
COMPLIANCE-9	Annual fees	Payment of Annual Energy Facility Compliance Fee
COMPLIANCE-10	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to the CPM, all notices, complaints, and citations.
COMPLIANCE-11	Planned Facility Closure	The project owner shall submit a closure plan to the CPM at least 12 months prior to commencement of a planned closure.
COMPLIANCE-12	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.
COMPLIANCE-13	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.
COMPLIANCE-14	Post-certification changes to the Decision	The project owner must petition the Energy Commission to delete or change a condition of certification, modify the project design or operational requirements and/or transfer ownership of operational control of the facility.

ATTACHMENT A
COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: AFC Number:
COMPLAINT LOG NUMBER _____ Complainant's name and address: Phone number:
Date and time complaint received: Indicate if by telephone or in writing (attach copy if written): Date of first occurrence:
Description of complaint (including dates, frequency, and duration):
Findings of investigation by plant personnel: Indicate if complaint relates to violation of a CEC requirement: Date complainant contacted to discuss findings:
Description of corrective measures taken or other complaint resolution: Indicate if complainant agrees with proposed resolution: If not, explain: Other relevant information:
If corrective action necessary, date completed: _____ Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)
This information is certified to be correct. Plant Manager's Signature: _____ Date:

(Attach additional pages and supporting documentation, as required.)

PREPARATION TEAM

GWF TRACY PROJECT
PREPARATION TEAM

Executive Summary ..... Alan Solomon

Introduction ..... Alan Solomon

Project Description ..... Alan Solomon

Air Quality..... Brewster Birdsall, P.E., QEP and Matthew Layton

Biological Resources..... Anne Wallace

Cultural Resources..... Beverly E. Bastian

Hazardous Materials Management ..... Alvin J. Greenberg, Ph.D. and Rick Tyler

Land Use.....Negar Vahidi and Jacob Hawkins

Noise and Vibration ..... Steve Baker

Public Health ..... Alvin J. Greenberg, Ph.D.

Socioeconomic Resources.....Jacob Hawkins M.E.S.M.

Soils and Water Resources..... Vince Geronimo, P.E. and Rachel Cancienne, EIT

Traffic and Transportation ..... Scott Debauche and William Walters

Transmission Line Safety and Nuisance ..... Obed Odoemelam, Ph.D.

Visual Resources ..... Marie McLean and William Walters

Waste Management ..... Steve Radis

Worker Safety and Fire Protection ..... Alvin J. Greenberg, Ph.D. and Rick Tyler

Facility Design..... Shahab Khoshmashrab

Geology and Paleontology ..... Patrick A. Pilling, PH.D., P.E., G.E..

Power Plant Efficiency.....Erin Bright

Power Plant Reliability.....Erin Bright

Transmission System Engineering.....Ajoy Guha, P.E. and Mark Hesters

Alternatives ..... Alan Solomon

General Conditions..... Angelique Juarez-Garcia

Project Secretary..... .April Albright

DECLARATION OF
Alan H. Solomon

I, **Alan H. Solomon**, declare as follows:

1. I am presently employed by The California Energy Commission in the **Siting, Transmission, and Environmental Protection Division** as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Executive Summary, Introduction, Project Description, and Alternatives**, for the GWF Tracy Combined-Cycle Power Plant Project, based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: August 25, 2009 Signed: Original signature in Dockets

At: Sacramento, California

Alan H. Solomon
2639 Bradford Way
West Sacramento, California 95691
(916) 371-4507 (home)
(916) 653-8236 (work)

Career Experience:

State of California, California Energy Commission
Project Manager, STEP — Oct 2008-Present
Conduct analyses of proposed or potential site areas; develop and recommend goals and objectives for a statewide facility siting program; develop, analyze and evaluate alternative facility siting plans; write research reports and prepare progress reports on plans; coordinate and review energy facility siting standards, conditions, and guidelines with Federal, State, regional, and local agencies, and related organizations involved with energy facility siting; conduct public hearings and work with residents. Working team leader or lead person over a group of specialists on complex projects.

State of California, Department of Mental Health
Ombudsman, System of Care — Nov 2005-Oct 2008
Lead person for the Department of Mental Health's Office of the Ombudsman. Assist people with their mental health concerns and questions. Making recommendations to policy decision makers. Conduct presentations and act as public liaison with outside mental health organizations. Work with internal Department of Mental Health staff in addressing countywide areas of concern. Analyze policy and legislation. Research compliance and regulatory issues, write reports, problem solving, and training.

State of California, Department of Social Services
Program Consultant, Office of Child Abuse Prevention — Sept 2004-Nov 2005
Assist with the development of the CWS Redesign within the State of California. Facilitate meetings related to the Differential Response aspect of the CWS Redesign, (these meetings include general Workgroup meetings, as well as, the Community Partnership, CWS/CMS Database, and Evaluation Task Groups). Assist on the Citizen Review Panel Workgroup. Analyze Child Welfare Services policy and legislation. Research compliance and regulatory issues. Develop databases and survey mechanisms. Write reports, issue papers, and All County Letters. Problem solving and public liaison.

State of California, Department of Health Services
Program Consultant, WIC Branch — Nov 2003-Sept 2004
Working with local and CBO WIC agencies. Tracking information, contract management, and ensuring quality assurance. Investigate alleged problems and assist the public with their problems, questions, concerns, special needs, and correspondence. Analyze policy and legislation. Research compliance and regulatory issues. Write reports, problem solving, public liaison, and staff/county training.

State of California, Department of Social Services
Program Consultant, Children's Services Operations Bureau — April 2000- Nov 2003
Assist Californian Counties with Children's Welfare Services (CWS) concerns, issues, and training. Assist the public with their CWS problems, questions, concerns, special needs, and correspondence. Investigate alleged problems within County CWS systems and child death issues. Analyze Child Welfare Services policy and legislation.

County of Sacramento, Department of Human Assistance
Human Services Specialist /Russian Community Liaison — Oct 1995-April 2000
Develop and conduct public assistance training; active participant on the School Attendance Review Board (SARB) Hearings; truancy sweeps; and, leadperson for Eligibility Trainees. Liaison between DHA and former Soviet Community; writing a bi-weekly column for a Russian-language newspaper; public relations; problem solving; and, community outreach.

Education: California State University, Long Beach – Bachelor of Arts, Political Science, May 1989
Certified in Russian Language and Culture

DECLARATION OF
James Brewster Birdsall

I, James Brewster Birdsall, declare as follows:

1. I am presently under contract with Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. Under Contract No. 700-05-002, I am serving as an Air Quality Specialist and Project Manager to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the final staff testimony on Air Quality and Greenhouse Gas Emissions for the GWF Tracy Combined Cycle Power Plant Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: August 27, 2009 Signed: Original signature in Dockets

At: San Francisco, California

Aspen
Environmental Group

BREWSTER BIRDSALL, P.E., QEP
Senior Associate, Air Quality and Engineering

ACADEMIC BACKGROUND
M.S., Civil Engineering, Colorado State University, 1993
B.S., Mechanical Engineering, Lehigh University, 1991

PROFESSIONAL EXPERIENCE

Mr. Birdsall is an environmental scientist who specializes in air quality and noise analyses for land development related projects and air quality risk assessments. He has nine years of consulting experience with expertise in environmental impact assessment under the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and the Clean Air Act. His focus is on air permitting, and air quality and noise-impact modeling, which includes field monitoring for traffic and other community noise sources.

Aspen Environmental Group — 2001 to present

Mr. Birdsall's project experience at Aspen includes the following:

Technical Studies for CEC Contract – Review of Power Plant AFCs. Mr. Birdsall assists the California Energy Commission (CEC) as a technical specialist by reviewing and providing testimony on Applications for Certification (AFC) for new power plants throughout California.

- **Tesla Power Plant.** Lead technical staff for air quality assessment and analyst of visible plumes for new 1,120 MW combined cycle power plant and 11-mile recycled water pipeline in rural eastern Alameda County near Tracy.
- **Inland Empire Energy Center.** Lead technical staff for air quality assessment for new 670 MW combined cycle power plant near Romoland in Riverside County.
- **Palomar Energy.** Lead technical staff for air quality assessment and supporting staff for cooling system studies for new 540 MW combined cycle power plant in northern San Diego County.
- **Kings River Conservation District Peaking Power Plant.** Lead technical staff for air quality assessment of new 97 MW simple cycle power plant in Fresno County.
- **Avenal Energy.** Lead technical staff for air quality assessment and analyst of visible plumes for large new combined cycle power plant near Avenal in Kings County.
- **Blythe Energy Project Phase II.** Lead technical staff for air quality assessment for new 520 MW combined cycle power plant and affiliated 118-mile transmission line, in the Mojave Desert and Coachella Valley of Riverside County.
- **Russell City Energy Center.** Lead technical staff for noise assessment of new 600 MW combined cycle power plant adjacent to shoreline recreational areas in Hayward.
- **Los Esteros Critical Energy Facility.** Lead technical staff for noise assessment and analyst of visible plumes for new 180 MW simple cycle power plant adjacent to recreational areas in San Jose.

- **Environmental Performance Report.** Technical review and editorial assistance for environmental portion of the first Integrated Energy Policy Report for the Governor and Legislature.
- **Air Quality Compliance.** Technical staff for analysis of modifications to permit conditions at the Moss Landing Power Plant. Prepared independent analysis of permit requirements and environmental consequences of increasing the capacity of the Midway-Sunset Cogeneration Project.
- **Alternative Cooling Technology Studies.** Supporting staff for analyses of dry cooling and hybrid cooling alternatives for the Cosumnes Power Plant and Palomar Energy Project. Coordinated and edited documentation from design engineers and other specialists.

For the **California Public Utilities Commission**:

- **San Onofre Nuclear Generating Station and Diablo Canyon Power Plant, Steam Generator Replacement Projects.** Currently serving as Deputy Project Manager for Environmental Impact Reports on the proposed improvements to these controversial nuclear power plants. Preparing certain administrative and technical portions of reports and coordinating the environmental documents with team of analysts.
- **Miguel-Mission 230 kV #2 Transmission Line.** Conducted the air quality and noise review for a system that would reduce transmission constraints between San Diego County and generators within the U.S. and Mexico. Provided oversight of the engineers studying impacts to traffic and transportation and the transmission system design.
- **Jefferson-Martin 230 kV Transmission Line.** Prepared air quality and noise studies for construction and operation of a 27-mile transmission line through urban and rural San Mateo County. The project is proposed to meet the projected electric demand in the Cities of Burlingame, Millbrae, San Bruno, South San Francisco, Brisbane, Colma, Daly City, and San Francisco.
- **Viejo System Transmission Project.** Prepared air quality, noise, and traffic analyses for construction of a controversial transmission improvement project in suburban south Orange County.
- **Looking Glass Networks Telecommunications Project.** Prepared the air quality and noise analyses for this Initial Study/Mitigated Negative Declaration (IS/MND) evaluating proposed fiber optic connections throughout the San Francisco Bay and Los Angeles areas, and developed programmatic mitigation measures for implementation of the metropolitan area network.

Presidio Trust, Presidio of San Francisco. Provided impact analysis for demolition, rehabilitation, and infill construction within the Public Health Service Hospital District, within the Golden Gate National Recreation Area and adjacent to sensitive San Francisco residences. Provided technical support and peer review of noise and vibration analyses related to the Doyle Drive Reconstruction through the Presidio of San Francisco. Involved protecting natural sounds consistent with National Park Service policy.

California State Lands Commission, Monterey Accelerated Research System Cabled Observatory. Providing technical analysis of air quality and noise effects of installing new underwater equipment in Monterey Bay. Supporting efforts of marine biologists with analysis of underwater noise.

California State Lands Commission, Concord-Sacramento Pipeline. Provided technical analysis of air quality and noise effects of constructing a new 20-inch, 70-mile petroleum products pipeline, including upgrades to storage tank facilities in Concord and distribution systems in West Sacramento.

California Department of Water Resources, Piru Creek Erosion Repairs and Bridge Seismic Retrofit Project. Provided assessment of air quality and noise impacts for construction of upgrades.

Ventura County Resource Conservation District, Casitas Springs *Arundo Donax* Removal Demonstration Project. Prepared estimates of community noise impacts and air quality assessment for cutting and removing non-native plants for improving flood control along the Ventura River.

Technical Support for U.S. Army Corps of Engineers. Analyzed construction noise and air quality effects and described applicability of general conformity rule for various flood control improvements in Arizona and Southern California.

Technical Support for Los Angeles Unified School District. Provided technical analysis of air quality and noise effects for school expansion, play area expansion, and temporary classroom projects, including reviews of cumulative, regional air quality consequences of temporary projects.

EIP Associates 1998 to 2001

As a Senior Environmental Scientist at **EIP Associates**, Mr. Birdsall performed comprehensive analyses of air quality and noise impacts for Environmental Impact Reports/Statements and independent studies. His projects at EIP included:

- **Bay Area Rapid Transit District, Oakland Airport Connector EIS/EIR.** Prepared noise impact evaluation and mitigation strategies. Conducted community noise monitoring and assessment according to Federal Transit Administration methodology.
- **Presidio Trust Implementation Plan EIS and Letterman Complex Supplemental EIS.** Prepared community noise impact assessment and traffic noise mitigation strategies. Air quality management policy consistency analysis. The plan was awarded the 2003 Outstanding Land Use Plan from the Association of Environmental Professionals.
- **San Francisco International Airport, Offshore Runway Construction Concepts, AGS Design Team.** Conducted preliminary environmental review of design and construction concepts for runway expansion. Prepared emission control strategies for general conformity rule.
- **Sacramento Metropolitan Airport Master Plan EIS/EIR, Sacramento County Department of Environmental Review and Assessment.** Baseline emission inventory and regulatory constraints.
- **Desert Resorts Regional Airport, Thermal, Riverside County.** Emission inventory and general conformity determination for runway extension and taxiway improvements.
- **San Joaquin Area Flood Control Agency, Stockton Areawide Flood Control Projects.** Reviewed emission inventories and retroactive general conformity rule applicability for construction activities.
- **Alameda County Flood Control and Water Conservation District, Zone 7, Altamont Water Treatment Plant EIR.** Analyzed air quality and community noise effects of three potential water plant sites in remote eastern Alameda County.
- **Santa Clara Valley Water District, Coyote Watershed, Lower Silver Creek Project.** Analyzed air quality and community noise effects for Initial Study/Environmental Assessment of constructing flood control improvements and habitat restoration.
- **University of California, Davis.** Prepared campuswide health risk assessment update, which included toxic air contaminant emission inventory and dispersion modeling using ISC.

- **University of California, Berkeley.** Prepared initial air quality and noise technical studies for Long Range Development Plan Update EIR and analyses for Northeast Quadrant Science and Safety Project (Stanley Hall replacement building) EIR.
- **Merced County, Draft University Community Plan.** Prepared air quality and noise background studies and policy discussion papers for the new Merced Campus of the University of California.
- **Allegro Jack London Square Project, SNK Development.** Provided expert testimony on the pile driving noise impacts to residents in a revitalized, high-density City of Oakland neighborhood. Conducted field surveys with City Staff and evaluated compliance with City noise ordinance.
- **Maranatha High School and Playing Fields Project, City of Sierra Madre.** Prepared the community noise technical study for a new private high school with outdoor amphitheater and athletic facilities. Characterized noise from events to determine impact level on sensitive residential community.
- **State Route 275 Modification Project, City of West Sacramento.** Prepared noise technical studies on the realignment of the State Route 275 Modification Project. Required assessment of new traffic noise impacts caused by rerouting traffic to grade level in close proximity of existing sensitive land uses and identification of feasible measures to insulate lodging uses.
- **City of Mountain View, Whisman Road Transit Oriented Development MND.** Deputy Project Manager for Negative Declaration related to high-density office development at the Middlefield-Ellis-Whisman Superfund Site. Prepared various technical sections, managed traffic subconsultant, and coordinated preparing the environmental documents with the city staff.

Trinity Consultants 1994 to 1998

Mr. Birdsall prepared compliance strategies, evaluated modeled impacts, and negotiated air permits while a Project Supervisor at **Trinity Consultants**, an environmental firm specializing in air quality.

- **Browning-Ferris Gas Services.** Coordinated nationwide Title V program implementation, secured numerous new source and operating permits, supported rollout of federal new source performance standards for municipal solid waste landfills and landfill gas to energy facilities.
- **Newmont Mining Joint Venture, Batu Hijau Project.** Environmental impact studies for open-pit metallic mineral mining facility and independent power production facility. Included noise assessment for "greenfield" power plant and air quality impacts evaluation in complex, coastal terrain.
- **Questar Pipeline, TransColorado Pipeline Project.** Secured new source permits for air quality effects related to construction and operation of major natural gas pipeline including compressor stations.
- **Coastal Field Services, Altamont Gas Plant.** Negotiated Title V operating permits for upstream natural gas processing plant and associated field compressor stations.
- **Solvay Soda Ash Joint Venture.** Developed particulate matter modeling protocol with State agency.
- **Potlatch Corporation.** Facilitywide emission inventory and permitting for a wood products plant. Included regionwide analyses of ambient air quality standards and resolving existing modeled violations.

NOISE IMPACT ASSESSMENT MODELS

- Federal Highway Administration Traffic Noise Model
- California Department of Transportation Traffic Noise Model (SOUND32)
- FTA Transit Noise Assessment and Mitigation Methodology

AIR QUALITY MODELING EXPERTISE

MVEI/EMFAC; URBEMIS; CALINE4; SCREEN; ISC; CTDM; TANKS; Landfill Gas Emissions Model.

ADDITIONAL TRAINING AND COURSES

- Fundamentals of Noise and Vibration for the California Energy Commission
- Expert Witness Training, California Energy Commission
- Co-Instructor, Air Permitting Issues for Municipal Solid Waste Landfills, Trinity Consultants
- Fundamentals of New Source Review Workshop, Air and Waste Management Association
- Title V and Compliance Assurance Monitoring Workshops, Air and Waste Management Association
- NATO Advanced Studies Institute, Wind Climates in Cities

PROFESSIONAL AFFILIATIONS AND AWARDS

- Professional Engineer (Mechanical, California #32565)
- Qualified Environmental Professional, Institute of Professional Environmental Practice (#03030005)
- 2001 Outstanding Performance Award presented by the California Energy Commission
- Air and Waste Management Association since 1994

PUBLICATIONS

Smith, P.J., J.B. Birdsall, and P.E. Delamater. "A Discussion of Air Permitting Issues for Landfill Gas-To-Energy Projects." 88th Annual Meeting and Exhibition of the Air and Waste Management Association, San Antonio, Texas, 1995.

Meroney, R.N., D.E. Neff, and J.B. Birdsall. "Wind-Tunnel Simulation of Infiltration Across Permeable Building Envelopes: Energy and Air Pollution Exchange Rates." 7th International Symposium on Measurement and Modeling of Environmental Flows. International Mechanical Engineering Congress and Exposition, San Francisco, California, 1995.

Birdsall, J.B. and R.N. Meroney. "Model Scale and Numerical Evaluation of Tracer Gas Distribution Due to Wind-Forced Natural Ventilation." 9th International Conference on Wind Engineering, New Delhi, India, 1995.

Birdsall, J.B. Physical and Numerical Simulation of Wind-Forced Natural Ventilation, MS Thesis, Colorado State University, Fort Collins, Colorado, 1993.

DECLARATION OF
MATTHEW S. LAYTON

I, Matthew S. Layton, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a Supervising Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the greenhouse gas analysis in the Air Quality section for the GWF TracyProject Final Staff Assessment based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: 7/28/09 Signed: Original signature in Dockets

At: Sacramento, California

Mark Hesters
Associate Electrical Engineer

Mark Hesters has sixteen years of experience in electric power regulation. He worked in the Engineering Office of the California Energy Commission's Energy Facilities Siting & Environmental Protection Division since 1998 providing analysis of California transmission systems and testimony on transmission systems in several Commission power plant certification processes. Prior to that Mark worked in the CEC's Electricity Analysis Office providing lead analysis on Southern California Edison resource issues and modeling support for all areas of California. He holds a B.S. degree from the University of California at Davis in Environmental Policy Analysis and Planning.

DECLARATION OF
Anne Wallace

I**, Anne Wallace**, declare as follows:

1. I am presently employed as a **consultant** to the California Energy Commission in the **Environmental Protection Office** of the **Energy Facilities Siting Division**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on biological resources for the **GWF Tracy Project** based on my independent analysis of the application and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: 8/14/09 Signed: Original signature in Dockets

At: Grass Valley, California

Anne Wallace

Certified Wildlife Biologist

Education

MS	Wildlife Science (1988)	Utah State University	Logan, UT
BS	Fisheries and Wildlife (1984)	Utah State University	Logan, UT

Employment History

2004-present	Principal/Senior Biologist	EcoBridges Environmental	Grass Valley, CA
1995-2004	Principal/Senior Biologist	Ibis Environmental, Inc	Grass Valley, CA
1990-1995	Wildlife Biologist	BioSystems Analysis, Inc	Tiburon, CA
1989-1990	Natural Resource Specialist	Spectrum Sciences and Software	Logan, UT
1988-1989	Research Technician	USFS Intermountain Research Station	Logan, UT
1986-1987	Consultant	Bio/West, Inc	Logan, UT
1986	Wildlife Biologist	US Fish and Wildlife Service	Honolulu, HI
1984-1987	Graduate Assistant	Utah State University Foundation	Logan, UT
1983-1984	Biological Technician	Utah State University	Logan, UT
1983	Biological Technician	Utah Division of Wildlife Resources	Ogden, UT

Professional Summary

Principal of EcoBridges Environmental, formerly cofounder of Ibis Environmental, Inc, Ms Wallace is a certified wildlife biologist with 26 years of experience (19 years in California) in a range of natural resource investigations including wildlife research, inventory, and survey techniques; trapping and tagging methods; technical writing; and technical editing. She specializes in endangered species surveys, habitat and impact assessment, and environmental compliance, having studied birds, mammals, fishes, reptiles, and plants. She has extensive experience with NEPA, CEQA, state/federal endangered species acts, the federal Clean Water Act, and all other relevant local, state, and federal regulations.

Ms Wallace's primary focus has been on identification, biology, and distribution of birds, especially raptors and wetland/riparian species. She has: flown and piloted aerial surveys of waterfowl and white pelicans; ground-surveyed nesting waterfowl and shorebirds; trapped, banded, and counted migrating raptors; banded raptor nestlings; surveyed and banded nesting colonial seabirds; conducted USFWS breeding bird surveys and Christmas bird counts; located sandhill crane nests by helicopter; and spent countless hours surveying threatened and endangered birds. In addition, she has conducted many San Joaquin kit fox surveys; monitored small-mammal traplines; and trapped, tranquilized, and tagged American marten. She has surveyed many California sensitive wildlife, following approved protocols where appropriate, including red-legged frog; yellow-legged frog; tiger salamander; branchiopods; tricolored blackbird; valley elderberry longhorn beetle; least Bell's vireo; sandhill crane; San Francisco garter snake; pond turtle; raptors, such as burrowing owl, goshawk, Cooper's hawk, spotted owl, and Swainson's hawk; California clapper and black rail; salt-marsh harvest mouse; western snowy plover; willow flycatcher (including southwestern subspecies); blunt-nosed leopard lizard; an endangered butterfly; and others, including rare plants.

Much of Ms Wallace's experiential background has been in and around freshwater wetlands, wet meadows, salt marshes, riparian zones, and their associated uplands, particularly in northern California, but she has also worked extensively with species in the grasslands and foothills associated with the Central Valley. Her work has also taken her to a variety of riparian, desert, coastal, and mountain habitats in Oregon, Utah, Idaho, Montana, Wyoming, Colorado, New York, and Hawaii, working on projects such as pipelines, transmission lines, highways, recreation trails, mine-site reclamation, geothermal development, Air Force airspace actions, windfarms, FERC hydroelectric relicensing, marsh restoration, and many others. Clients include cities, counties, state agencies, federal agencies, utilities, private developers, and nonprofits.

Selected Professional Experience

- Using field surveys, GIS, GPS, and aerial photos, documented potential and actual occurrence of all special-status wildlife and fishes in every span of 814 miles of existing transmission line ROW, as well as along 300+ miles of ROW access roads and at four communications sites in northern California (from Oregon border to central CA). Co-wrote species-specific project conservation measures for every special-status animal and fish potentially affected. Wrote wildlife and fisheries sections of NEPA EA and was technical editor for draft EA and final EA. Prepared two section 7 biological assessments (for USFWS and for NMFS). Currently engaged in section 7 consultation with USFWS and NMFS.

- Field surveys along 16 miles of transmission line corridor and 50 miles of access roads, using GIS, GPS, and aerial maps, to document potential occurrence of special-status invertebrates, fishes, amphibians, reptiles, birds, and mammals in Trinity County.

- Baseline data collection on California tiger salamanders (including dipnetting), western spadefoot toads, fairy shrimps, San Joaquin kit foxes, foothill yellow-legged frogs, and western pond turtles in appropriate habitats on portions of 47,000 acres of vernal pool grasslands in eastern Merced County.

- Dipnetting and seining for CTS and vernal pool branchiopods for a development project in Valley Springs, Calaveras County, a proposed large-rock mine southeast of Sacramento, and annual continuing-education sampling in Sacramento and Yolo counties.

- NEPA and federal ESA compliance for Indian Gaming project for tribal nation in west-central Sierra foothills: wetlands, California red-legged frogs, and valley elderberry longhorn beetles.

- Ten years of monitoring California red-legged frogs and San Francisco garter snakes at West-of-Bayshore property, San Mateo County, San Francisco International Airport, during annual cattail management. Additionally, intensive monitoring of California red-legged frogs and San Francisco garter snakes for canal dredging operation, and monitoring for a number of other maintenance activities annually since late 1990s.

- Protocol surveys for least Bell's vireo on a tributary of the Pajaro River (Santa Clara County) for proposed flood-control project.

- Permitting, preparation of Caltrans Natural Environment Study, section 7 consultation for California red-legged frogs, for El Dorado County bridge widening and sewer pipe-replacement project. Responsible for sensitive wildlife and plants, wetlands, and cultural/archaeological resources.

- Ongoing (since 2000) on-call surveys, habitat assessments, and impact assessments for California red-legged frogs, western pond turtles, California least terns, and nesting shorebirds and waterfowl for a 2400-acre long-term, multiphase tidal wetland restoration project at Montezuma Slough and Suisun Bay, Solano County, including annual nest monitoring for new least tern nesting colony.

- Impact assessment and consultation for SF Public Utilities Commission project along Alameda Creek in Sunol Valley. Proposed fishery habitat improvement through increasing reservoir releases and water recapture facilities. Evaluation and consultation on potential impacts to California red-legged frogs, Alameda whipsnakes, foothill yellow-legged frogs, special-status raptors, and a variety of other birds and amphibians.

- Prepared initial alternatives analysis report and technical lead (wildlife, wetlands, botany) on joint NEPA/CEQA Environmental Assessment/Initial Study for a complex and controversial bicycle trail proposal through Bay wetlands, San Mateo County, involving wetland impacts, endangered species impacts (California clapper rail and salt-marsh harvest mouse), private property issues, airport/airspace safety concerns, and recovery habitats named in a recovery plan. Impact assessment and mitigation development. High degree of public involvement. Prepared BA. Complex interagency coordination with USFWS, CDFG, NMFS, EPA, BCDC, RWQCB, Coastal Conservancy, U.S. Coast Guard, FAA, and manager of a local airport.

Selected Professional Experience

- Sensitive-species surveys for several phases of a natural gas pipeline (site assessment, pre-construction, and monitoring), and route selection and site assessment for a transmission line in northeastern California. Species included sandhill cranes, Cooper's hawks, sharp-shinned hawks, willow flycatchers, Swainson's hawks, yellow warblers, tricolored blackbirds, black terns, prairie falcons, desert kit foxes, burrowing owls, pygmy rabbits, and the rare plants *Eriogonum nutans* var. *nutans* and *Sphaeralcea grossularifolia*. Conducted five helicopter surveys to locate greater sandhill crane nests.

- Initial assessments and constraints analysis for several alternative sites and facilities for expanded wastewater treatment facility in Amador County. Responsible for special-status wildlife (including California red-legged frog) and plants, wetlands, and cultural/historical resources.

- Foothill yellow-legged frog and pond turtle surveys along Middle and South forks of the Stanislaus River for PG&E FERC hydroelectric relicensing project, in spring and early summer for egg masses, in mid to late summer for tadpoles, and in fall for metamorphs.

- Foothill yellow-legged frog surveys in six tributaries to the North Fork Feather River for PG&E hydroelectric relicensing project for juveniles and adults.

- Four-year study and monitoring of foothill yellow-legged frogs throughout the North Fork Mokelumne River for PG&E FERC hydroelectric relicensing. Spring/early summer surveys for egg masses included snorkeling. Also mid to late summer surveys for tadpoles, fall surveys for metamorphs, and juveniles and adults found throughout the season.

- Study to evaluate potential impacts of short-term power-generation water releases on foothill yellow-legged frog tadpoles in late summer for PG&E. Conducted pre-release, mid-release, and post-release tadpole surveys, and measured wetted perimeter changes for mid-release and post-release flows.

- Habitat assessment and field surveys for California red-legged frogs in support of PG&E's relicensing efforts for the Mokelumne River Project. Surveys encompassed more than 60 sites in Amador and Calaveras counties along the Mokelumne River drainage.

- Habitat assessment and field surveys for California red-legged frogs in support of PG&E's relicensing of the Rock Creek/Cresta hydroelectric project. The project area includes about 100 miles of transmission line and the Feather River drainage above Lake Oroville.

- Ran a 6-week pine marten trapline in High Uintah Mountains, Utah, alone. Captured (or recaptured), tranquilized, banded, processed, and released 17 marten.

- Protocol surveys for northern spotted owls for Marin Municipal Water District for potential impacts related to instream fishery habitat improvement projects. Located several pairs and one active nest. Monitored spotted owl fledgling.

- Evaluated potential impacts to northern spotted owls and marbled murrelets of a project to improve fishery habitat for steelhead and coho salmon in a Marin County creek. Projects include modification of stream channel by addition of woody-debris structures and beneficial gravel and cobble, construction of two sediment traps, riparian restoration and revegetation, and control of sedimentation through sediment-reduction measures.

- Dozens of protocol surveys for San Joaquin kit foxes including automatic camera stations, track stations, nighttime spotlighting, and ground searches for dens throughout Central Valley, from southern Kern Co north through San Benito, Fresno, Madera, Merced, Monterey, and Contra Costa counties.

- Sensitive-wildlife surveys for Bonneville Power Administration (BPA) powerline in northeastern California. Species included sandhill cranes, raptors (Swainson's hawks, prairie falcons, golden eagles, northern harriers, and others), willow flycatchers, and yellow warblers.

Selected Professional Experience

- Caltrans surveys for San Joaquin kit foxes, Swainson's hawks and other raptors, special-status bats, and tricolored blackbirds for highway bypass in the Central Valley. Caltrans Natural Environmental Study.

- Sensitive-species surveys for proposed geothermal development in Modoc County, California, for private developer, nesting activities and movements of sandhill cranes; goshawk nesting surveys using taped-call playback transects; waterfowl, western snowy plovers, and Swainson's hawks and other raptors.

- Small-mammal trapping study at north and south ends of Golden Gate Bridge for ecorisk assessment. Collected a variety of small mammals for tissue samples at each of 11 distinct study, reference, and ambient/control areas.

- Trapped, banded, and counted migrating raptors for Goshutes Raptor Migration Project, Nevada, and Golden Gate Raptor Observatory, Marin Headlands, California, during many fall migrations. Trapped, banded, measured, and released captured raptors.

- Consultation with USFWS and CDFG regarding impacts of proposed flood-control project to coastal salt marsh and endangered species (California clapper rail and salt-marsh harvest mouse) for Town of Corte Madera in Marin County. Potential impacts included altering tidal flow, habitat conversions, habitat loss, sedimentation, changes in salinity, temporary and permanent construction-related impacts, and indirect and interrelated effects.

- Land-bird surveys for evaluating potential effects of environmental contaminants on local peregrine falcons through the food chain. Study was conducted for the US Navy on Yerba Buena Island, San Francisco Bay. Point-count methods were used to census all birds seen or heard on plots situated throughout the island.

- Small-mammal trapping study at Alameda Naval Air Station (Alameda Co) to collect tissue samples for chemical analysis. 2200 trap-nights completed in a variety of saltmarsh and adjacent upland habitats. More than 200 house mice and rats were collected for analysis of contaminant concentrations in tissue.

- Permitting, formal consultation, and wildlife surveys for biological portions of politically complex, 11-mile pipeline for East Bay Municipal Utility District. Agencies: USFWS (Section 7 consultation), CDFG (2081 MA and/or streambed alteration), RWQCB (401 water quality), Corps of Engineers (404 wetlands). Species and issues: wetlands, rare plants, California red-legged frog, California tiger salamander (including protocol surveys), western pond turtle, nesting raptors.

- Monthly waterfowl surveys for two years in freshwater wetlands around Great Salt Lake for a bird-aircraft strike hazard (BASH) study for Hill Air Force Base, Utah.

- Section 7 consultation and field surveys for federally and commonwealth endangered Puerto Rican boa in Puerto Rico for proposed gravel extraction and housing development in karst rainforest. Biological assessment and mitigation and monitoring plan.

- Small-mammal trapping study at Concord Naval Weapons Station on Suisun Bay (Contra Costa County) with the dual purpose of establishing salt-marsh harvest mouse presence and collecting tissue samples of house mice for analysis of chemical contaminants (ie, PCBs, metals, pesticides, and dioxins). Completed a total of 662 trap-nights in two non-tidal saltmarsh areas. Collected/skinned 68 house mice and deer mice for tissue analysis; captured, weighed, measured, and released 12 SMHM.

- Surveys and data analysis on multi-year study to assess the impacts of wind energy development on raptor populations in the Altamont Pass and Solano County Wind Resource Areas for the California Energy Commission. Study researched the cause, extent, and relative significance of mortality to birds from wind turbine development. Also evaluated the developmental and environmental features that may affect raptor mortality, including turbine type, siting, topography, prey base, and weather patterns. Extrapolated a level of golden eagle mortality that was later demonstrated to be accurate.

Selected Professional Experience

- Ecorisk assessment for four tidal and nontidal wetland sites at Concord Naval Weapons Station (Contra Costa County). Evaluated potential risk to six receptors of a variety of chemicals of potential concern (COPCs). Participated in design of models to simulate passage of COPCs through the food chain using chemical characterizations, habitat descriptions, and natural history information. Site-specific doses were calculated for each of six mammal and bird species.

- Ecological risk assessment for railroad facility in Whitefish, Montana. Habitats of concern were riverine and riparian. Collected field data and evaluated risk to several mammalian, fish, and bird receptors of a variety of chemicals of potential concern (COPCs). Participated in design of models to simulate passage of COPCs through the food chain using chemical characterizations, habitat descriptions, and natural history information.

- Monitored white pelicans for the US Air Force, Hill Air Force Base, Utah. Examined flight corridors, flight patterns, and high-use areas, for a bird-aircraft strike hazard (BASH) study. Also, studied white pelican foraging habitat in northern Utah, including piloting my own aerial surveys, trapping fish for species composition and relative abundance, analyzing fish gut contents, and measuring water quality parameters. Also designed a small study to investigate the feasibility of using primercord, an explosive, as a fish sampling technique in wetland habitats.

- Natural resource specialist and technical editor for four NEPA EAs evaluating potential impacts, including noise and visual disturbance, of a variety of US Air Force airspace actions to wildlife, big game, and endangered species; recreationists; Native American tribes; wild horses and domestic cattle; and designated scenic river values. Actions included changes in aircraft and associated noise levels, and changes to airspace use over both urbanized and wild areas, as well as changes in bombing range use. Study sites were in South San Francisco Bay, upstate New York, Long Island, Idaho, and Oregon.

- Evaluated nine San Francisco Bay wetland complexes for their potential to support special-status birds and amphibians in each of 923 distinct habitat units of different habitat types as part of mitigation planning for San Francisco International Airport runway expansion project. Specifically evaluated potential for California least terns, western snowy plovers, bald eagles, peregrine falcons, California clapper rails, California black rails, brown pelicans, and California red-legged frogs.

- California clapper and black rail surveys along Pinole shoreline, San Pablo Bay, for fiberoptic cable project. Passive listening for clapper rails, taped-call playbacks for black rails. Both species detected.

- California clapper rail and salt-marsh harvest mouse surveys for the Army Corps of Engineers for proposed flood-control modifications to salt marsh, San Francisco Bay, Marin County. Salt-marsh harvest mice were live-trapped, fur-clipped, and released. Recaptures were documented and a population estimate derived. Clapper rail surveys were aural and included use of taped-call playbacks.

- California clapper rail surveys for San Mateo County for proposed bicycle trail. Methods included sunrise and sunset aural censuses for eight weeks. Aural census only. Characterized habitat and assessed habitat quality.

- California clapper and black rail surveys in Emeryville Crescent, Alameda County, for radio-tower construction. Aural census only; both species detected. Mapped calls and estimated size of local population. Consulted with USFWS.

Certifications and Memberships

Certified Wildlife Biologist
Member, The Wildlife Society
Member, Association of Field Ornithology
Recovery permits: California tiger salamander, vernal pool branchiopods, California least tern, and California clapper rail

DECLARATION OF
Beverly E. Bastian

I, **Beverly E. Bastian**, declare as follows:

1. I am presently employed by The California Energy Commission in the **Siting, Transmission, and Environmental Protection Division** as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Cultural Resources,** for the GWF Tracy Combined-Cycle Power Plant Project, based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: July 30, 2009 Signed: Original signature in Dockets

At: Sacramento, California

Beverly E. Bastian
1516 Ninth Street MS 40
Sacramento, CA 95814-5504
(916) 654-4840 email: bbastian@energy.state.ca.us

Education	Field	Degree	Year
University of California, Davis	Anthropology	B.A	1967
University of California, Davis	Anthropology	M.A	1969
Tulane University	Anthropology	A.B.D.	1975
University of Mississippi	American History	(courses only)	1989
University of California, Santa Barbara	Public (American) History and Historic Preservation	A.B.D.	1996

Experience

State of California, California Energy Commission *2005 to present*
Planner II, Siting, Transmission, and Environmental Protection Division, Environmental Office, Biological and Cultural Unit
All tasks related to the production of the cultural resources sections of CEQA-equivalent (California Environmental Quality Act) documents for the environmental review of proposed 50-MW+ power plants in California, including: Evaluating data in applications; writing data requests to applicants and doing independent research to compile an inventory of and evaluate the historical/cultural significance of cultural resources subject to significant impacts from proposed projects; providing and receiving information in public hearings on applications; analyzing all pertinent data; writing Staff Assessments of impacts; identifying California Register of Historical Resources-eligible cultural resources; developing mitigation measures to reduce to insignificant any impacts to Register-eligible cultural resources; providing expert testimony on my analyses and recommendations in public hearings; and reviewing compliance with mitigation measures during the construction, operation, and decommissioning of certified power plants. Additional tasks include: providing prefiling assistance to applicants; coordinating environmental review of power plant projects with cultural resources specialists in sister state agencies and in federal agencies; supervising and reviewing the work of Commission cultural resources consultants; reviewing the CEQA documents of sister state agencies; and developing internal procedures and guidelines to improve cultural resources review of applications.

State of California, Department of Parks and Recreation *2001 to 2005*
Historian II, Cultural Resources Division, Cultural Resources Support Unit
Major and complex historical and historic architectural investigations and studies dealing with the significance, integrity, and management of historic buildings, structures, and landscapes in California's state parks; participation in interdisciplinary teams and project assignments; preparation of technical reports and correspondence; inventorying and evaluating historic properties; coordinating the statewide registration of historical properties; assessing the eligibility of historic properties to the National Register of Historic Places and the California Register of Historical Resources; reviewing environmental documents and providing technical analyses of major Departmental projects to determine impacts to cultural resources under State and federal laws; identifying resource issues and constraints; establishing allowable use and development guidelines; developing approaches to protect, enhance, and perpetuate cultural resources under relevant State and federal laws, regulations, and standards; proposing and developing programs, policies, and budgets to meet Department's historic preservation missions.

Department of Social Sciences, American River College *2000 to 2002*
Instructor (part-time), American History
Creation and presentation of classroom lectures, selection of assigned texts and readings, creation and administration of quizzes and examinations, assignment and supervision of student research papers, student consultation in office hours, grading of all quizzes, tests, and papers, and assigning final student grades. These research, organizing, and teaching skills demonstrate ability to organize information, to speak effectively to the public, and to train and direct other personnel.

Department of Sociology and Anthropology, University of Mississippi *1987 to 1989*
Archaeologist, Center for Archaeological Research
All tasks for the completion of the historical archaeological part of an archaeological survey and testing program final report related to a U. S. Army Corps of Engineers erosion control project in twelve north-central Mississippi counties, including: Coordinating the activities of a field crew and the research of historians working in archives; setting up an artifact database using survey data to generate statistical summaries for discovered historical archaeological sites; gathering historical settlement and land-use data for twelve counties; conducting a special statistical analysis and synthesis of historical data only, focusing on pre-and post-Civil War land tenure and agricultural production for plantations in two counties where soil fertility contrasted; synthesizing data from all sources, collaborating on the final cultural resources management report with archaeologists specializing in prehistory and survey and sampling methodology; presenting findings at the annual meeting of the Society for Historical Archaeology in 1989.

Gilbert Commonwealth, Inc. *1984 to 1987*
Historical Archaeologist and Project Manager, Environmental Unit
All tasks as Principal Investigator for six major historical archaeological and/or historical architectural cultural resources management projects done under contract to federal, state, and local governments, including: Writing winning proposals for these projects; negotiating and managing project budgets; gathering/supervising the gathering of historical, oral historical, and archaeological data; analyzing/supervising the analysis of gathered data; and writing/supervising the writing of reports of findings, along with the creation of maps, illustrations, and data tables for these reports; serving as the historian and historical preservationist on several multidisciplinary teams tasked with siting the routes for several major power lines in east Texas.

Tennessee Valley Authority (personal services contract) *1979 to 1981, 1983-1984*
Historical Archaeologist (self-employed)
All tasks as Principal Investigator for various cultural resources management projects in areas affected by TVA construction, the most significant of which were: the complete excavation of and report on seven nineteenth-century log-cabin sites in Cedar Creek Reservoir in northwestern Alabama; and all historical research, the field work, and the report for the underwater remote-sensing reconnaissance and underwater videotaping of sunken Civil War cargo boats and gunboats at Johnsonville, Tennessee, in the western part of the Tennessee River.

Other Archaeological Projects *1966 to 1981*

Professional Societies
Register of Professional Archaeologists, #10683
Society for Historical Archaeology
California Council for the Promotion of History
Vernacular Architecture Forum
Society for California Archeology

DECLARATION OF
Alvin J. Greenberg, Ph.D.

I**, Alvin J. Greenberg, Ph.D.** declare as follows:

1. I am presently a consultant to the California Energy Commission, Energy Facilities Siting and Environmental Protection Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on the **Public Health, Hazardous Materials Management,** and **Worker Safety/Fire Protection** sections for the **GWF Tracy Combined Cycle Power Plant Application** based on my independent analysis of the amendment petition, supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: Aug. 25, 2009 Signed: Original signature in Dockets

At: Sacramento, California

Risk Science Associates

121 Paul Dr., Suite A, San Rafael, Ca. 94903-2047
415-479-7560 fax 415-479-7563
e-mail agreenberg@risksci.com

Name & Title: **Alvin J. Greenberg, Ph.D., FAIC, REA, QEP**
Principal Toxicologist

Dr. Greenberg has had over two decades of complete technical and administrative responsibility as a team leader in the preparation of human and ecological risk assessments, air quality assessments, hazardous materials handling and risk management/prevention, infrastructure vulnerability assessments, occupational safety and health, hazardous waste site characterization, interaction with regulatory agencies in obtaining permits, and conducting lead surveys and studies. He has particular expertise in the assessment of dioxins, lead, diesel exhaust, petroleum hydrocarbons, mercury, the intrusion of subsurface contaminants into indoor air, and the preparation and review of public health/public safety sections of EIRs/EISs. Dr. Greenberg's expertise in risk assessment has led to his appointment as a member of several state and federal advisory committees, including the California EPA Advisory Committee on Stochastic Risk Assessment Methods, the US EPA Workgroup on Cumulative Risk Assessment, the Cal/EPA Peer Review Committee of the Health Risks of Using Ethanol in Reformulated Gasoline, the California Air Resources Board Advisory Committee on Diesel Emissions, the Cal/EPA Department of Toxic Substances Control Program Review Committee, and the DTSC Integrated Site Mitigation Committee. Dr. Greenberg is the former Chair of the Bay Area Air Quality Management District Hearing Board, a former member of the State of California Occupational Health and Safety Standards Board (appointed by the Governor), and former Assistant Deputy Chief for Health, California OSHA. And, since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments, power plant security programs, and conducting safety and security audits of power plants for the California Energy Commission and has assisted the CEC in the assessment of safety and security issues for proposed LNG terminals. In addition to providing security expertise to the State of California, Dr. Greenberg was the Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Years Experience: 26

Education:

B.S. 1969 Chemistry, University of Illinois Urbana

Ph.D. 1976 Pharmaceutical/Medicinal Chemistry, University of California, San Francisco

Postdoctoral Fellowship 1976-1979 Pharmacology/Toxicology, University of California, San Francisco

Postgraduate Training 1980 Inhalation Toxicology, Lovelace Inhalation Toxicology Research Institute, Albuquerque, NM

Professional Registrations:

Board Certified as a Qualified Environmental Professional (QEP)
California Registered Environmental Assessor - I (REA)
Fellow of the American Institute of Chemists (FAIC)

Professional Affiliations:

Society for Risk Analysis
Air and Waste Management Association
American Chemical Society
American Association for the Advancement of Science
National Fire Protection Association

Technical Boards and Committee Memberships - Present:

Squaw Valley Technical Review Committee
(appointed 1986)

Technical Boards and Committee Memberships - Past:

July 1996 – March 2002
Member, Bay Area Air Quality Management District Hearing Board
(Chairman 1999-2002)
September 2000 – February 2001
Member, State Water Resources Control Board Noncompliant Underground Tanks Advisory Group
January 1999 – June 2001
Member, California Air Resources Board Advisory Committee on Diesel Emissions
January 1994 - September 1999
Vice-Chairman, State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee
September 1998
Member, US EPA Workgroup on Cumulative Risk Assessment
April 1997 - September 1997
Member, Cal/EPA Private Site Manager Advisory Committee
January 1986 - July 1996
Member, Bay Area Air Quality Management District Advisory Council
(Chairman 1995-96)
January 1988 - June 1995
Member: California Department of Toxic Substance Control Site Mitigation Program Advisory Group
January 1989 - February 1995
Member: Department of Toxics Substances Control Review Committee, Cal-EPA

October 1991 - February 1992
Chair: Pollution Prevention and Waste Management Planning Task Force of the Department of Toxics Substances Control Review Committee, Cal-EPA

September 1990 - February 1991
Member: California Integrated Waste Management Board Sludge Advisory Committee

September 1987 - September 1988
ABAG Advisory Committee on Regional Hazardous Waste Management Plan

March 1987 - September 1987
California Department of Health Services Advisory Committee on County and Regional Hazardous Waste Management Plans

January 1984 - October 1987
Member, San Francisco Hazardous Materials Advisory Committee

March 1984 - March 1987
Member, Lawrence Hall of Science Toxic Substances and Hazardous Materials Education Project Advisory Board

Jan. 1, 1986 - June 1, 1986
Member, Solid Waste Advisory Committee, Governor's Task Force on Hazardous Waste

Jan. 1, 1983 - June 30, 1985
Member, Contra Costa County Hazardous Waste Task Force

Sept. 1, 1982 - Feb. 1, 1983
Member, Scientific Panel to Address Public Health Concerns of Delta Water Supplies, California Department of Water Resources

Present Position

January 1983- present
Owner and principal with Risk Sciences Associates, a Marin County, California, environmental consulting company specializing in multi-media human health and ecological risk assessment, air pathway analyses, hazardous materials management-infrastructure security, environmental site assessments, review and evaluation of EIRs/EISs, preparation of public health and safety sections of EIRs/EISs, and litigation support for toxic substance exposure cases.

Previous Positions

Jan. 2, 1983 - June 12, 1984
Member, State of California Occupational Safety and Health Standards Board (Cal/OSHA), appointed by the Governor

Aug. 1, 1979 - Jan. 2, 1983
Assistant Deputy Chief for Health, California Occupational Safety and Health Administration

Feb. 1, 1979 - Aug. 1, 1979

Administrative Assistant to Chairperson of Finance Committee, Board of Supervisors, San Francisco

Jan. 1, 1976 - Feb. 1, 1979
Research Pharmacologist and Postdoctoral Fellow, Department of Pharmacology and Toxicology, School of Medicine, University of California, San Francisco

Jan. 1, 1975 - Dec. 31, 1975
Acting Assistant Professor, Department of Pharmaceutical Chemistry, University of California, San Francisco

Experience

General

Dr. Greenberg has been a consultant in Hazardous Materials Management and Security, Human and Ecological Risk Assessment, Occupational Health, Toxicology, Hazardous Waste Site Characterization, and Toxic Substances Control Policy for over 26 years. He has broad experience in the identification, evaluation and control of health and environmental hazards due to exposure to toxic substances. His experience includes Community Relations Support and Risk Communication through experience at high-profile sites and presentations at professional society meetings.

He has considerable experience in the review and evaluation of exposure via the air pathway - particularly to emissions from power plants, refineries, and diesel exhaust - and a thorough knowledge of the regulatory requirements through his experience at Cal/OSHA, the BAAQMD Hearing Board, as a consultant to the California Energy Commission, and in preparing such assessments for local government and industry. He has assessed exposures to diesel exhaust during construction and operations of stationary and mobile sources and has testified at evidentiary hearings numerous times on this subject.

He is presently assisting the California Energy Commission in assessing the risks to workers and the public of proposed power plants and LNG terminals in the state. His experience in hazard identification, exposure assessment, risk assessment, occupational safety and health, emergency response, and Critical Infrastructure Protection has made him a valuable part of the CEC team addressing this issue. He has reviewed and commented on the DEIS/DEIR for the proposed SES LNG Port of Long Beach terminal, focusing on security issues for the CEC and on safety matters for the City of Long Beach. He has presented technical information and analysis to the State of California Interagency LNG Working Group on thermal radiation public exposure criteria and safety/security at an east coast urban LNG terminal. (Both presentations are confidential owing to the nature of the material.) He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

He served for over five years as the Vice-chair of the California State Water Resources Control Board Advisory Committee convened to address toxic substances in sediments in bays, rivers, and estuaries. He has been a member of the Squaw Valley Technical Review Committee since 1986 establishing chemical application management plans at golf courses to protect surface and

groundwater quality. He has also conducted numerous ecological risk assessments and characterizations, including those for marine and terrestrial habitats.

Dr. Greenberg has extensive experience in data collection and preparation of human and ecological risk assessments on numerous military bases and industrial sites with Cal/EPA DTSC and RWQCB oversight. He has also been retained to provide technical services to the Cal/EPA Department of Toxic Substances Control (preparation of human health risk assessments) and the Office of Environmental Health Hazard Assessment (review and evaluation of air toxics health risk assessments and preparation of profiles describing the acute and chronic toxicity of toxic air contaminants). He has also conducted several surveys of sites containing significant lead contamination from various sources including lead-based paint, evaluated potential occupational exposure to lead dust and fumes in industrial settings, prepared numerous human health risk assessments of lead exposure, and prepared safety and health plans for remedial investigation of lead contaminated soils. Dr. Greenberg is also a recognized expert on the requirements of California's Proposition 65 and has served as an expert on Prop. 65 litigation.

Liquefied Natural Gas (LNG)

Dr. Greenberg assisted the CEC in the preparation of the "background" report on the risks and hazards of siting LNG terminals in California ("LNG in California: History, Risks, and Siting" July 2003) and consulted for the City of Vallejo on a proposed LNG terminal and storage facility at the former Mare Island Naval Shipyard. He has also conducted an evaluation and prepared comments on the risks, hazards, and safety analysis of the DEIS/DEIR for the City of Long Beach on a proposed LNG terminal at the Port of Long Beach (POLB) and conducted an analysis on vulnerability and critical infrastructure security for the CEC on this same proposed LNG terminal. He currently advises the CEC on the POLB LNG proposal on risks, hazards, human thresholds of thermal exposure, vulnerability, security, and represented the CEC at a U.S. Coast Guard briefing on the Waterway Suitability Assessment that included the sharing of SSI (Sensitive Security Information). He has presented technical information and analysis to the State of California LNG Interagency Working Group on thermal radiation public exposure criteria and safety/security at an east coast urban LNG terminal. (Both presentations are confidential owing to the nature of the material.) He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

Infrastructure Security

Since 2002, Dr. Greenberg has been trained by and is working with the Israeli company SB Security, LTD, the most experienced and tested security planning and service company in the world. Since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments and power plant security programs for the California Energy Commission (CEC). In taking the lead for this state agency, Dr. Greenberg has interfaced with the California Terrorism Information Center (CATIC) and provided analysis, recommendations, and testimony at CEC evidentiary hearings regarding the security of power plants within the state. These analyses include the assessment of Critical Infrastructure Protection, threat assessments, criticality assessments, and the preparation of vulnerability assessments and off-site consequence analyses addressing the use, storage, and transportation of hazardous materials, recommendations for security to reduce the threat from foreign and domestic terrorist activities, perimeter security, site access by personnel and vendors, personnel background checks,

management responsibilities for facility security, and employee training in security methods. Dr. Greenberg is the lead person in developing a model power plant security plan, vulnerability assessment matrix, and a security training manual for the CEC. The model security plan is used by power plants in California as guidance in developing and implementing security measures to reduce the vulnerability of California's energy infrastructure to terrorist attack. He has testified at several evidentiary hearings for the CEC on power plant security issues. He also leads an audit team conducting safety and security audits at power plants throughout California that are under the jurisdiction of the CEC. In addition to providing security expertise to the State of California, in August 2004, a team of experts led by Dr. Greenberg was awarded an 18-month contract by the State of Hawaii to update and improve the state's Energy Emergency Preparedness Plan and make recommendations for increased security of critical energy infrastructure on this isolated group of islands.

Air Pathway Analysis

Dr. Greenberg has prepared numerous Air Pathway Analyses and human health risk assessments, evaluating exposure at numerous locations in California, Hawai'i, Oregon, Minnesota, Michigan, and New York. He is experienced in working with Region IX EPA, the State of California DTSC, and the Hawai'i Department of Health Clean Air Branch in the application of both site-specific and non site-specific health risk assessment criteria.

Examples

Human Health Risk Assessment for the Open Burn/Open Detonation Operation at McCormick Selph, Inc., Hollister, Ca. (June 2003)

Air Quality and Human Health Risk Assessment for the Royal Oaks Industrial Complex, Monrovia, Ca. (January 2003)

Human Health Risk Assessment and Indoor Vapor Intrusion Assessment for the former Pt. St. George Fisheries Site, Santa Rosa, Ca. (October 2002)

Human Health Risk Assessment for the former Sargent Industries Site, Huntington Park, Ca. (July 2001)

Ballard Canyon Air Pathway Analysis and Human Health Risk Assessment, Santa Barbara County, Ca. (September 2000)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca.
(March, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawai'i (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (March 1993)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Cancer Risk Assessment for the H-Power Generating Station, Campbell Industrial Park, Oahu, Hawai'i (1988)

Hazardous Materials Assessments, Waste Management Assessments, Worker Safety and Fire Protection Assessments, and Public Health Impacts Assessments

Dr. Greenberg also has significant experience as a consultant and expert witness for the California Energy Commission providing analysis, recommendations, and testimony in the areas of hazardous materials management, process safety management, waste management, worker safety and fire protection, and public health impacts for proposed power plant/cogeneration facilities. These analyses include the evaluation and/or preparation of the following:

- Off-site consequence analyses of the handling, use, storage, and transportation of hazardous materials,
- Risk Management Plans (required by the Cal-ARP) and Business Plans (required by H&S Code section 25503.5),
- Safety Management Plans (required by 8 CCR section 5189),
- Natural gas pipeline safety,
- Solid and hazardous waste management plans,
- Phase I and II Environmental Site Assessments,
- Construction and Operations Worker Safety and Health Programs,
- Fire Prevention Programs,
- Human health risk assessment from stack emissions and from diesel engines, and
- Mitigation measures to address PM exposure, including diesel particulates

Examples

- San Francisco Energy Reliability Project, San Francisco, Ca. 2004-present. Hazardous materials management, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Malburg Generating Station Project, City of Vernon, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Blythe II, Blythe, Ca. 2002-3. hazardous materials, worker safety/fire protection,
- Palomar Energy Center, Escondido, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Project, Rancho Seco, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Project, Tesla, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- San Joaquin Valley Energy Center, San Joaquin, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management
- Morro Bay Power Plant, Morro Bay, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Potrero Power Plant Unit 7, San Francisco, Ca., 2001-2: hazardous materials, worker safety/fire protection
- El Segundo Power Redevelopment Project, El Segundo, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Rio Linda Power Project, Rio Linda, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Pastoria II Energy Facility Expansion, Grapevine, Ca., 2001: hazardous materials, worker safety/fire protection
- East Altamont Energy Center, Byron, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Magnolia Power Project, Burbank, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Russell City Energy Center, Hayward, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Woodbridge Power Plant, Modesto, Ca., 2001: hazardous materials, worker safety/fire protection, waste management
- Colusa Power Plant Project, Colusa County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Valero Refinery Cogeneration Project, Benicia, Ca., 2001: hazardous materials, worker safety/fire protection
- Ocotillo Energy Project, Palm Springs, Ca., 2001: hazardous materials, worker safety/fire protection
- Gilroy Energy Center Phase II Project, Gilroy, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Los Esteros Critical Energy Facility, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Roseville Energy Facility, Roseville, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health

- Spartan Power, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- South Star Cogeneration Project, Taft, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Plant, Eastern Alameda County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tracy Peaker Project, Tracy, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Henrietta Peaker Project, Kings County, Ca., 2001: hazardous materials, worker safety/fire protection, waste management, public health
- Central Valley Energy Center, San Joaquin, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Plant, Rancho Seco, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Los Banos Voltage Support Facility, Western Merced County, Ca., 2001-2: waste management, public health
- Palomar Energy Project, Escondido, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Metcalf Energy Center, San Jose, Ca., 2000-1: hazardous materials
- Blythe Power Plant, Blythe, Ca., 2000-1: hazardous materials
- San Francisco Energy Co. Cogeneration Project, San Francisco, Ca., 1994-5: hazardous materials
- Campbell Soup Cogeneration Project, Sacramento, Ca., 1994: hazardous materials
- Proctor and Gamble Cogeneration Project, Sacramento, Ca., 1993-4: hazardous materials
- San Diego Gas and Electric South Bay Project, Chula Vista, Ca., 1993: hazardous materials
- SEPCO Project, Rio Linda, Ca., 1993: hazardous materials
- Shell Martinez Manufacturing Complex Cogeneration Project, Martinez, Ca., 1993: hazardous materials and review and evaluation of EIR
- SFERP Project, San Francisco, Ca. 2004 – 2006. hazardous materials, worker safety/fire protection, waste management, public health

Occupational Safety and Health/Health and Safety Plans/Indoor Air Quality

Dr. Greenberg has significant experience in occupational safety and health, having directed the development, adoption, and implementation of over 50 different Cal/OSHA regulations, including airborne contaminants (>450 substances), lead, asbestos, confined spaces, and worker-right-to-know (MSDSs). He has conducted numerous occupational health surveys and has extensive experience in the sampling and analysis of indoor air quality at residences, workplaces, and school classrooms. He is currently the team leader conducting safety and security audits at power plants throughout California for the California Energy Commission. Safety issues audited include compliance with regulations addressing several safety matters, including but not limited to, confined spaces, lockout/tagout, hazardous materials, and fire prevention/suppression equipment.

Examples

Review and Evaluation of Public and Worker Safety Issues at the proposed SES LNG Facility, Port of Long Beach. prepared for the City of Long Beach. (November 2005)

Confidential safety and security audit reports for 18 power plants in California. prepared for the California Energy Commission. (January 2005 through March 2006)

Report on the Accidental release and Worker Exposure to Anhydrous Ammonia at the BEP I Power Plant, Blythe, Ca. prepared for the California Energy Commission. (October 2004)

Investigation of a Worker Death in a Confined Space, La Paloma Power plant. prepared for the California Energy Commission. (July 2004)

Preliminary Report on Indoor Air Quality in Elementary School Portable Classrooms, Marin County, Ca. (December 1999)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Air Pathway Analysis for the Ballard Canyon Landfill. Submitted to the County of Santa Barbara, (March 1999)

Review and Evaluation of the Health Risk Assessment for Outdoor and Indoor Exposures at the Former Golden Eagle Refinery Site, Carson, Ca. (May 1998)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Determination of Occupational Lead Exposure at a Tire Shop in Placerville, Ca. (April 1993)

Development of an Environmental Code of Regulations for Hazardous Waste Treatment Facilities on La Posta Indian Tribal lands, San Diego County, Ca. (August 1992)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Sites with RWQCB and/or DTSC Oversight

Dr. Greenberg has specific experience in assessing human health and ecological risks at contaminated sites at the land/water interface, including petroleum contaminants, metals, mercury, and VOCs at several locations in California including Oxnard, Richmond, Avila Beach, Mare Island Naval Shipyard, San Diego, Hollister, San Francisco, Hayward, Richmond, the Port of San Francisco, and numerous other locations. He has used Cal/EPA methods, US EPA

methods, and ASTM Risk Based Corrective Action (RBCA) and Cal/Tox methodologies. He is extremely knowledgeable about SWRCB and SF Bay RWQCB regulations on underground storage tank sites and with ecological issues presented by contaminated sediments including sediment analysis, toxicity testing, tissue analysis, and sediment quality objectives. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Dr. Greenberg experience on many of these contaminated sites has been as a consultant to local governments, state agencies, and citizen groups. He assisted the City and County of San Francisco in developing local ordinance requiring soil testing (Article 20, Maher ordinance) and hazardous materials use reporting (Article 21, Walker ordinance). He served as the City of San Rafael's consultant to provide independent review and evaluation of the site characterization and remedial action plan prepared for a former coal gasification site. He was a consultant to a citizen group in northern California regarding exposure and risks due to accidental releases from a petroleum refinery and assisted in the assessment of risks due to crude petroleum contamination of a southern California beach. He has prepared a number of risk assessments addressing crude petroleum, diesel and gasoline contamination, including coordinating site investigations, environmental monitoring, and health risk assessment for the County of San Luis Obispo regarding Avila Beach subsurface petroleum contamination. That high-profile project lasted for over one year and Dr. Greenberg managed a team of experts with a budget of $750,000. Another high-profile project included the preparation of an extensive comprehensive human and ecological risk assessment for the Hawaii Office of Space Industry on rocket launch impacts and transportation/storage of rocket fuels at the southern end of the Big Island of Hawaii. Dr. Greenberg's risk assessments were part of the EIS for the project. Dr. Greenberg also worked on another high-profile project conducting Air Pathway Analysis of off-site and on-site impacts from landfill gas constituents, including indoor and outdoor air measurements, air dispersion modeling, flux chamber investigations, and health risk assessment for the County of Santa Barbara. Dr. Greenberg has conducted RI/FS work, prepared health risk assessments, evaluated hazardous waste sites and hazardous materials use at numerous locations in California, Hawaii, Oregon, Minnesota, Michigan, and New York. He has considerable experience in the development of clean-up standards and the development of quantitative risk assessments for site RI/FS work at CERCLA sites, as well as site closures, involving toxic substances and petroleum hydrocarbon wastes. He is experienced in working with both Region IX EPA and the State of California DTSC in negotiating clean-up standards based on the application of both site-specific and non site-specific health and ecological based clean-up criteria. He has significant experience in the development of site chemicals of concern list, quantitative data quality levels, site remedial design, the site closure process, the design and execution of data quality programs and verification of data quality prior to its use in the decision making process on large NPL sites.

Examples

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)
The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment, Ecological Screening Evaluation, and Development of Proposed Remediation Goals for the Flair Custom Cleaners Site, Chico, California (January 1996)

Human Health Risk Assessment for the X-3 Extrudate Project at Criterion Catalyst, Pittsburg, Ca. (November 1994)

Screening Health Risk Assessment and Development of Proposed Soil Remediation Levels at Hercules Plant #3, Culver City, Ca. (July 1993)

Ecological Screening Evaluation for the Altamont Landfill, Alameda County, Ca. (June, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawaii (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (March 1993)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca.
(March, 1993)

Screening Health Risk Assessment for the Proposed Expansion of the West Marin Sanitary Landfill, Point Reyes Station, Ca.
(March, 1993)

Health Risk Assessment for the Proposed Expansion of the Forward, Inc. Landfill, Stockton, Ca. (September 14, 1992)

Health Risk Assessment for the Rincon Point Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Health Risk Assessment for the South Beach Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Screening Health Risk Assessment and Development of Proposed Soil and Groundwater Remediation Levels, Kaiser Sand and Gravel, Mountain View, Ca. Prepared for Baseline Environmental Consulting (January 30, 1992)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Preliminary Health Risk Assessment for the City of Pittsburg Redevelopment Agency, Pittsburg, California (May 29, 1991)

Military Bases

Dr. Greenberg has experience in conducting assessments at DOD facilities, including RI/FS work, preparation of health risk assessments, evaluation of hazardous waste sites and hazardous materials use at the following Navy sites in California: San Diego Naval Base; Marine Corps Air-Ground Combat Center, 29 Palms; Mare Island Naval Shipyard, Vallejo; Treasure Island Naval Station, San Francisco, Hunters Point Naval Shipyard, San Francisco, and the Marine Corps Logistics Base, Barstow. He worked with the U.S. Navy and the U.S. EPA in the implementation of Data Quality Objectives (DQO's) at MCLB, Barstow.

Examples

Review and Evaluation of the Remedial Investigation Report and Human Health Risk Assessment for the U. S. Naval Station at Treasure Island, Ca. (June 1999)

Screening Health Risk Assessment for the Proposed San Francisco Police Department's Helicopter Landing Pad at Hunters Point Shipyard, San Francisco, Ca. (September 1997)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Health Risk Assessment for the Chrome Plating Facility, Mare Island Naval Shipyard, Vallejo, California (October 24, 1988)

Background Levels and Health Risk Assessment of Trace Metals present at the Naval Petroleum Reserve No.1, 27R Waste Disposal Trench Area, Lost Hills, California (August 12, 1988)

RCRA Facility Investigation (RFI) Work Plan of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 14, 1989)

Hazardous Waste and Solid Waste Audit and Management Plan, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (July 3, 1989)

Water Quality Solid Waste Assessment Test (SWAT) Proposal RCRA Landfill, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (October 31, 1988)

Waste Disposal Facilities, Waste Haulers, Waste Recycling Facilities Report, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 22, 1988)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Air Quality Solid Waste Assessment Test (SWAT) Proposal, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 25, 1988)

Mercury Contamination

Dr. Greenberg has prepared and/or reviewed several human health and ecological risk assessments regarding mercury contamination in soils, sediments, and indoor surfaces. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Examples

Review and evaluation of a human health risk assessment of ingestion of sport fish caught from San Diego Bay and which contain tissue levels of mercury and PCBs (November 2004 – present)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

DECLARATION OF
Rick Tyler

I, **Rick A. Tyler**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting Office of the Energy Facilities Siting Division as a Senior Mechanical Engineer**.**

2. A copy of my professional qualifications and experience were included in the FSA, and is incorporated by reference herein.

3. I supervised the preparation of Staff Testimony on Hazardous Materials Management, Worker Safety / Fire Protection and Public Health for the GWF Tracy Project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: September 28, 2009 Signed: Original signature in Dockets

At: Sacramento, California

RICK TYLER

Associate Mechanical Engineer

CALIFORNIA ENERGY COMMISSION

EDUCATION B.S., Mechanical Engineering, California State University, Sacramento. Extra course work in Statistics, Instrumentation, Technical Writing, Management; Toxicology, Risk Assessment, Environmental Chemistry, Hazardous Materials Management, Noise Measurement, and regulations regarding control of toxic substances.

Near completion of course work necessary to obtain a certificate in hazardous materials management from University of California, Davis.

EXPERIENCE

Jan. 1998-Present — California Energy Commission - Senior Mechanical Engineer
Energy Facility Siting and Environmental Protection Division

Responsible for review of Applications for Certification (applications for permitting) for large power plants including the review of handling practices associated with the use of hazardous and acutely hazardous materials, loss prevention, safety management practices, design of engineered equipment and safety systems associated with equipment involving hazardous materials use, evaluation of the potential for impacts associated with accidental releases and preparation and presentation of expert witness testimony and conditions of certification. Review of compliance submittals regarding conditions of certifications for hazardous materials handling, including Risk Management Plans Process Safety Management.

April 1985-Jan. 1998 — California Energy Commission - Health and Safety
Program Specialist; Energy Facility Siting and Environmental Protection Division.

Responsible for review of Public Health Risk Assessments, air quality, noise, industrial safety, and hazardous materials handling of Environmental Impact Reports on large power generating and waste to energy facilities, evaluation of health effects data related to toxic substances, development of recommendations regarding safe levels of exposure, effectiveness of measures to control criteria and non-criteria pollutants, emission factors, multimedia exposure models. Preparation of testimony providing Staff's position regarding public health, noise, industrial safety, hazardous materials handling, and air quality issues associated with proposed power plants. Advise Commissioners, Management, other Staff and the public regarding issues related to health risk assessment of hazardous materials handling.

Nov. 1977-
April 1985

California Air Resources Board - Engineer (last 4 years Associate level)

Responsible for testing to determine pollution emission levels at major industrial facilities; including planning, supervision of field personnel, report preparation and case development for litigation; evaluate, select and acceptance-test instruments prior to purchase; design of instrumentation systems and oversight of their repair and maintenance; conduct inspections of industrial facilities to determine compliance with applicable pollution control regulations; improved quality assurance measures; selected and programmed a computer system to automate data collection and reduction; developed regulatory procedures and the instrument system necessary to certify and audit independent testing companies; prepared regulatory proposals and other presentations to classes at professional symposia and directly to the Air Resources Board at public hearings. As state representative, coordinated efforts with federal, local, and industrial representatives.

PROFESSIONAL AFFILIATIONS/ LICENSES

Past President, Professional Engineers in California Government Fort Sutter Section;
Past Chairman, Legislative Committee for Professional Association of Air Quality Specialists. Have passed the Engineer in Training exam.

PUBLICATIONS, PROFESSIONAL PRESINTATIONS AND ACCOMPLISHMENTS

Authored staff reports published by the California Air Resources Board and presented papers regarding continuous emission monitoring at symposiums.

Authored a paper entitled "A Comprehensive Approach to Health Risk Assessment", presented at the New York Conference on Solid Waste Management and Materials Policy.

Authored a paper entitled "Risk Assessment A Tool For Decision Makers" at the Association of Environmental Professionals AEP Conference on Public Policy and Environmental Challenges.

Conducted a seminar at University of California, Los Angeles for the Doctoral programs in Environmental Science and Public Health on the subject of "Health Risk Assessment".

Authored a paper entitled "Uncertainty Analysis -An Essential Component of Health Risk Assessment and Risk Management" presented at the EPA/ORNL expert workshop on Risk Assessment for Municipal Waste Combustion: Deposition, Uncertainty, and Research Needs.

Presented a talk on off-site consequence analysis for extremely hazardous materials releases. Presented at the workshop for administering agencies conducted by the City of Los Angeles Fire Department.

Evaluated, provided analysis and testimony regarding public health and hazardous materials management issues associated with the permitting of more than 20 major power plants throughout California.

Developed Departmental policy, prepared policy documents, regulations, staff instruction, and other guidance documents and reference materials for use in evaluation of public health and hazardous materials management aspects of proposed power plants.

Project Manager on contracts totaling more than $500,000.

RES.RT

DECLARATION OF
Testimony of Negar Vahidi

I**, Negar Vahidi,** declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as a **Senior Project Manager/Senior Land Use Technical Specialist**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Land Use** for the **GWF Tracy Combined Cycle Power Plant Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: August 3, 2009 Signed: Original signature in Dockets

At: Agoura Hills, California

NEGAR VAHIDI
Senior Associate

ACADEMIC BACKGROUND

Master of Public Administration, University of Southern California, 1993
B.A., Political Science, University of California, Irvine, 1991

Ms. Vahidi is a planner with more than nine years experience in socioeconomic, land use, and public policy analysis for major infrastructure, development, flood control, and institutional projects throughout the State of California. Her expertise lies in demographic data assessment and technical studies, identification and categorization of existing land uses, policy consistency analysis and policy development, evaluation of physical socioeconomic and land use impacts, and development of land use alternatives. A brief list of relevant projects for which she has conducted socioeconomic and land use assessments, or managed the preparation of the environmental document, is provided below:

Land Use Assessment for Industrial Projects:

- Pacific Pipeline EIS/SEIR Project
- Alturas Transmission Line EIR/S Project
- Santa Fe Pacific Pipeline EIR Project
- Six Flags Substation and Power Line Project
- Calnev Substation and Power Line Project
- Yellowstone Pipeline Reroute EIS Project
- CPUC Hydroelectric Plant Divestiture Project - ongoing

Environmental Studies

- MTA Mid-City/Westside Corridor Study
- St. Francis Medical Hospital Focused EIR
- Santa Monica College Parking Structure B EIR
- Berkeley Manor Condominium Technical Reports
- Huntington Beach Waterfront Development Project Section 108 Loan Guarantee Funds EA
- Imperial Beach Shore Protection EIR/EIS
- U.S. Food and Drug Administration Laboratory EIR/EIS
- National Guard Armory Building EA
- EA for Area Lighting, Fencing, and Roadways at the International Border
- Border Patrol Checkpoint Station EA

Specific Plans, Residential and Mixed-Use Development, and Redevelopment Projects

- Wes Thompson Ranch Development Project EIR
- Cabrillo Plaza Specific Plan EIR
- Culver City Redevelopment Plan and Merger EIR
- Dana Point Headlands Specific Plan EIR
- Seaview Court Condominiums IS/MND
- Pico Union Block 6 Residential Development Revised EIR
- Four-Story Hotel IS/MND, City of Santa Monica
- Santa Monica College Parking Structure B Replacement EIR
- Huntington Beach Blocks 104/105 Redevelopment Project EIR
- Berkeley Manor Condominiums EIR
- Santa Monica North Main St. Mixed-Use Development Project EIR

Water and Wastewater Facilities

- San Antonio Dam EIS
- Whitewater/Thousand Palms Flood Control Project
- San Antonio Creek Bridges Project at Vandenberg Air Force Base
- Lower Santa Ana River Operations and Maintenance EA

Resource Management

- Upper Newport Bay Environmental Restoration Project
- Rio Salado Environmental Restoration EIS

Miscellaneous Studies

- Pacific Pipeline Mitigation Monitoring, Compliance and Reporting Program
- Technical Support to NEPA Lawsuit
- Industry-wide Survey for the South Coast Air Quality Management District

Professional Affiliations

- American Planning Association, Los Angeles Chapter Board Member

DECLARATION OF
Testimony of Jacob Hawkins

I**, Jacob Hawkins,** declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as a **Technical Specialist**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Socioeconomics** and **Land Use** for the **GWF Tracy Combined Cycle Power Plant Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: August 3, 2009 Signed: Original signature in Dockets

At: San Francisco, California

JACOB I. HAWKINS

Environmental Planner

ACADEMIC BACKGROUND

Master of Environmental Science and Management, University of California, Santa Barbara, 2001
B.S. (with High Honors), Biology, San Francisco State University, 1999

PROFESSIONAL EXPERIENCE

Mr. Hawkins is an environmental professional with a multidisciplinary background in the environmental sciences. While concentrating in ecology for his undergraduate degree, as a graduate student at the Donald Bren School of Environmental Science and Management he focused on environmental regulation and economics. For his thesis, he used spatial and demographic data to evaluate the environmental justice and socioeconomic impacts of Los Angeles' RECLAIM program. He has extensive experience preparing Environmental Impact Reports (EIR) in compliance with the California Environmental Quality Act (CEQA) and Environmental Impact Statements (EIS) in compliance with the National Environmental Policy Act (NEPA) as well as NEPA/CEQA joint documentation.

Aspen Environmental Group — August 2001 to present

Mr. Hawkins has provided CEQA and NEPA analysis and project management for major utility development and infrastructure projects and contributed analyses to plan formulation and feasibility studies for a variety of restoration projects. He has conducted the majority of his environmental impact assessments in the areas of land use, socioeconomics and environmental justice, public services and utilities, and recreation, but has also assisted in the preparation of assessments for environmental hazards and hazardous materials, biology and air quality. His project experience at Aspen includes the following:

California Energy Commission (CEC). Under Aspen's CEC contracts, Mr. Hawkins assisted with the research, analysis and production of land use, socioeconomics, and alternatives Staff Assessments used during the CEC's CEQA equivalent review process for the following power plant applications:

- **Genesis Solar Energy Project, Riverside County, CA.** Mr. Hawkins will be drafting the Land Use analysis and preparing the Socioeconomics Staff Assessment for this 125-MW solar-thermal facility approximately 25-miles west of the City of Blythe in Riverside County. Mr. Hawkins will be evaluating the project with regard to California property tax law excluding the construction of solar facilities from the taxation of new construction. Mr. Hawkins will also be contacting local public service agencies to determine impacts the project might have and potential costs that would not be covered by property tax revenues. As the project is located on Bureau of Land Management property, Mr. Hawkins will be evaluating issues in a manner consistent with both the CEC's CEQA-equivalent process as well as with NEPA.
- **GWF Tracy, Tracy, CA.** Mr. Hawkins drafted the Land Use analysis and prepared the Socioeconomics Staff Assessment for this 145-MW expansion to the existing 169-MW Tracy Peaker Project. Mr. Hawkins contacted senior planners in San Joaquin County to identify the County's zoning determination for the project. Mr. Hawkins examined potential impacts resulting from loss of agricultural land using LESA modeling.

- **Carrizo Energy Solar Facility, San Luis Obispo County, CA.** Mr. Hawkins performed the Socioeconomics analysis for this 177-MW, 640-acre solar thermal facility. Mr. Hawkins evaluated the project with regard to California property tax law excluding the construction of solar facilities from the taxation of new construction. Mr. Hawkins also contacted local public service agencies to determine impacts the project might have and potential costs that would not be covered by property tax revenues.
- **Bullard Energy Center, Fresno, CA.** Mr. Hawkins is preparing the Socioeconomics and Land Use Staff Assessments for this 199 MW natural gas peaking facility in the City of Fresno. Mr. Hawkins prepared data requests and the issue identification report, including determining the necessity for a zoning change for the proposed project.
- **MMC Chula Vista, Chula Vista, CA.** Mr. Hawkins is coordinating the production of the Socio-economic Staff Assessment for this 100 MW natural gas-fired peaker plant in the City of Chula Vista. Mr. Hawkins has reviewed and edited the data requests and issue identification report for Socioeconomics.
- **Desert Southwest Transmission Project, Riverside County, CA.** Mr. Hawkins was brought in to review and revise sections of the Desert Southwest Transmission Project staff assessment per CEC comments and findings made in the Devers-Palo Verde No. 2 500 kV Transmission Line Project EIS/EIR.
- **Tracy Peaker Project, Tracy, CA.** Mr. Hawkins drafted the Land Use Preliminary Staff Assessment for this 169 MW simple-cycle peaking facility in an unincorporated area of San Joaquin County. He contacted senior planners in San Joaquin County and City of Tracy to determine zoning and Williamson Act status of the site as well as other planned projects for the area. Mr. Hawkins examined potential impacts resulting from loss of agricultural land under Williamson Act Contract and evaluated rapidly growing cumulative development in the region. He also assisted with the preparation of the Preliminary and Final Staff Assessments required in the CEC review process, and testified during the Evidentiary Hearing.
- **Sacramento Municipal Utility District Cosumnes Power Plant Project, Sacramento, CA.** Mr. Hawkins prepared the Socioeconomic Preliminary and Final Staff Assessments as well as the Alter-natives Final Staff Assessment for this 1,000 MW combined-cycle natural gas facility. Project con-struction included the installation of a 26-mile natural gas pipeline in addition to the 30-acre power plant site. Socioeconomic issues examined included housing, employment, tax-base, public utility, education, and public services in the affected area. Mr. Hawkins analyzed and screened proposed alternative project sites and linear facilities. He coordinated further field surveys and mapping by Technical Seniors for additional alternative project sites and linear facilities.
- **Tesla Power Project, Alameda County, CA.** Mr. Hawkins assisted with the preparation of the Land Use Staff Assessment for this 1,120 MW combined-cycle natural gas power facility. The project included the construction of the Tesla Power Project generating facility, 0.8 miles of double-circuit 230 kV transmission lines, a 24-inch, 2.8-mile natural gas pipeline, and a 1.7-mile water line. Mr. Hawkins analyzed local land use plans (general plans, zoning ordinances, community plans, environmental assessment documents, etc) to assess power plant consistency with local, State, and federal regulations.
- **Malburg Generating Station, Vernon, CA.** Mr. Hawkins collected baseline data and analyzed key socioeconomic impacts associated with this 120 MW electrical generating facility, including housing, employment, tax-base, public utility, education, and public service issues in the affected area. He assisted with the preparation of the Socioeconomic Data Adequacy and Data Request Reports for the CEC review process.
- **East Altamont Energy Center, Alameda County, CA.** Mr. Hawkins contacted senior planners in Alameda County, Contra Costa County, San Joaquin County, and the City of Tracy to determine

zoning and Williamson Act status of the proposed 1,100 MW natural gas–fired power plant as well as other planned projects for the area. He conducted site surveys for compatibility with existing surrounding uses and evaluated potential impacts due to loss of Prime Farmlands and non-compliance with local land use plans. Mr. Hawkins drafted the Land Use Preliminary Staff Assessment and assisted in preparation in the Final Staff Assessment.

- **Inland Empire Energy Center, Riverside County, CA.** Mr. Hawkins contacted planners in Riverside County, and the Cities of Menifee, Perris, and Sun City to determine zoning and General Plan designation status for the proposed 670 MW combined-cycle, natural gas–fired generating facility as well as other planned projects for the area. Associated linear facilities for the project include a new 18-inch, 4.7-mile non-reclaimable wastewater pipeline. Mr. Hawkins conducted site surveys to determine project compatibility with existing surrounding uses. He examined potential impacts to planned school uses, loss of agricultural lands, and potential non-compliance with local land use plans. Mr. Hawkins drafted the Land Use Preliminary Staff Assessment and assisted in preparation in the Final Staff Assessment.
- **Magnolia Power Project, Burbank, CA.** Mr. Hawkins collected baseline data and analyzed key socioeconomic impacts associated with this 250 MW natural gas, combined-cycle electrical generating facility. He examined potential impacts to housing, employment, tax-base, public utility, education, and public service in the affected area. Mr. Hawkins also assisted in preparation of the Staff Assessment and attended the Staff Assessment Workshop
- **Coastal Plant Study.** The study includes identification and evaluation of potential environmental issues associated with California's 25 coastal power plants. Mr. Hawkins performed interviews of coastal plant licensing project managers to identify potential political, social, community, and physical impacts that arose in the modernization, re-tooling, and expansion of a selection of California's coastal plants. He drafted case studies for the Huntington, Contra Costa, and El Segundo Power Plant Projects and assisted in preparation of the Lessons Learned section of the study, which describes the issues common to many of the coastal plants and methods used to mitigate these issues.
- **2005 Integrated Energy Policy Report.** Mr. Hawkins researched nuclear power plants that provide energy to California for inclusion in the Out of State Power Generation and Imports White Paper for the 2005 IEPR. Mr. Hawkins compiled information on the characteristics of the different nuclear power plants that contribute to California's energy grid and provided a brief analysis of the biological and water resource issues common to these plants.

Los Angeles Unified School District (LAUSD). Mr. Hawkins has contributed in the management and production of CEQA documents (EIRs, IS/MNDs, and Categorical Exemption Memos) for LAUSD projects. His responsibilities on these projects have ranged from research, analysis, and production of documents to client interface, QA/QC activities, budget tracking, and assignment coordination as a Deputy Project Manager. Mr. Hawkins has contributed to the following projects under this contract:

- **Canoga Park New Elementary School IS/MND.** As Deputy Project Manager, Mr. Hawkins coordinated technical analyses, and prepared the geology, hazards and hazardous materials, and hydrology sections for the IS/MND. This project included construction of a 536-seat charter elementary school to be developed by New Economics for Women/LCB Enterprises. Mr. Hawkins met with LAUSD and New Economics for Women/LCB Enterprises representatives to discuss the administrative draft of the document and assisted in preparation and production of the draft public document.
- **Hughes Middle School IS.** Mr. Hawkins acted as Deputy Project Manager in charge of coordinating technical analyses for the IS. This project included the remodeling of a 1600-seat middle school currently used as an adult education center and administrative offices for use as a high school. Mr. Hawkins met with LAUSD representatives to discuss the development of the project and issues associated with moving the administrative offices and adult school to a new location.

- **Belmont Senior High School Modular Building Categorical Exemption.** Mr. Hawkins acted as Deputy Project Manager in charge of coordinating the technical analyses and composing the memorandum in support of a CEQA Class 32 Categorical Exemption. The addition of modular buildings to the senior high school was found to be exempt from CEQA as it consisted of an in-fill project meeting the conditions of Class 32. Mr. Hawkins assisted in review and preparation of the documents filed with the State Clearinghouse and with LAUSD.
- **LAUSD New School Construction Program EIR.** Mr. Hawkins performed the aesthetics and public service analyses for this program level document while developing sets of associated impact assessment methodologies and menus of possible mitigation measures for future project-level environmental analyses. He assisted in review and editing of the social science sections prior to publication of the draft document.
- **East Valley New Middle School No. 2 EIR.** Mr. Hawkins analyzed and compiled the measures taken by LAUSD during the site selection process to ensure environmental health and safety during the construction and operation of the proposed school at the previous Van Nuys Drive-In. He prepared the Project Design Feature section of the EIR describing LAUSD design standards and measures employed to minimize environmental impacts.
- **East Valley New High School No. 1B EIR.** Mr. Hawkins performed the air quality and alternatives assessment and assisted in preparation of the hazards and hazardous material assessment for the EIR. The proposed project involved construction of a 1,392-seat high school on the site of a former California Department of Transportation equipment yard. He conducted site surveys, performing noise measurements and surveying for potential environmental impacts by existing land uses, and determined alternative sites for the proposed school.

U.S. Army Corps of Engineers, Los Angeles District. Mr. Hawkins has been responsible for a variety of tasks on Corps projects ranging from meeting with Corps project leads to performing GIS analysis and modeling for environmental assessment, plan formulation, and feasibility study documents to coordinating subcontractors, client interface, QA/QC activities, and budget tracking as a Project Manager and Deputy Project Manager. He has worked on the following Corps projects:

- **Port of Los Angeles Channel Deepening Project SEIS/SEIR, Los Angeles County, CA.** Mr. Hawkins reviewed the Noise, Public Health and Safety, and Utilities sections of the SEIS/SEIR for the Port of Los Angeles Channel Deepening Project which proposes to provide additional disposal capacity necessary to complete the Federal Channel Deepening Project.
- **Heacock and Cactus EA, Riverside County, CA.** Mr. Hawkins prepared the Land Use analysis for this flood control project involving the alteration of Heacock and Cactus Channels adjacent to March Air Force Base in Riverside County. Mr. Hawkins evaluated the existing and planned land uses for the area, as well as examining the noise, visual, and traffic impacts, to determine the potential impacts that the project could have on land uses adjacent to Heacock and Cactus Channels.
- **Matilija Dam Ecosystem Restoration EIS/EIR and Feasibility Studies, Ventura County, CA.** Mr. Hawkins coordinated issue analysis and prepared required CEQA/NEPA sections as the Deputy Project Manager for the Matilija Dam project. The dam was constructed in 1948 to store water for agriculture and to provide flood protection. Because of sedimentation that has occurred behind the dam, it currently has very little water storage capacity and virtually no flood control function. The purpose of the feasibility study is to evaluate alternatives for removing the dam in order to allow passage for steelhead trout and possibly to allow sediment to move downstream to replenish sand on area beaches. Mr. Hawkins sat on the Environmental Working Group Habitat Subgroup and assisted in evaluating the quality of existing habitat and projecting habitat conditions under future with- and without-project scenarios. He used GIS and vegetation survey data to calculate and model existing habitat values for areas above the Matilija Dam and downstream along the Ventura River for the feasibility study.

- **Las Vegas Wash Desert Tortoise Monitoring, Clark County, NV.** Mr. Hawkins managed the desert tortoise monitoring for the F-1 and F-4 Detention Basins and Channels of the Las Vegas Wash in Clark County, Nevada. Mr. Hawkins managed subcontractors and monitoring efforts prior to and during Corps construction projects in the F-1 and F-4 Basins and Channels. He also coordinated monitoring personnel approvals from the Bureau of Land Management and Fish and Wildlife Service when necessary.
- **Sulphur Creek Ecosystem Restoration Project Integrated DPR/EA, Orange County, CA.** Mr. Hawkins acted as the Deputy Project Manager in charge of coordinating subcontractors and technical analysis sections. He coordinated conferences with Corps and City of Laguna Niguel representatives to discuss the HGM analysis used in the project. He conducted site surveys to take noise measurements and photographs for the noise and aesthetic sections of the DPR/EA. He also assisted in production of the administrative draft DPR, including preparation of the soils, climate, air quality, hazards and toxic waste, utilities, noise, traffic, and safety sections.
- **El Vado Wash Ecosystem Restoration Project DPR, Tucson, AZ.** As the Deputy Project Manager, Mr. Hawkins coordinated technical analysis sections and acted as a liaison with the USACE and the City of Tucson. He also conducted site surveys in addition to reviewing and editing the document and provided QA/QC for the Habitat Evaluation Procedure.
- **Prado Basin Final Supplemental EIS/EIR, Orange County, CA.** Mr. Hawkins assisted in the development of a GIS to map vegetation above Prado Dam and in Reach 9 and model the effects of different flow rates from Prado Dam spillover on Santa Ana River basin vegetation. He made final revisions to the SEIS per discussions between the Army Corps of Engineers and the Fish and Wildlife Service and assisted in production of the final document. Mr. Hawkins revised and edited the Lake and Streambed Alteration Program Project Questionnaire for the project. He also coordinated bird monitoring in Reaches 1 and 2 of the lower Santa Ana River.
- **Agua Fria Wash Ecosystem Restoration Project DPR, Maricopa County, AZ.** Mr. Hawkins provided editing and QA/QC for the project's Habitat Evaluation Procedure.
- **Northeast Phoenix Drainage Area Alternatives Analysis Report, Phoenix and Scottsdale, AZ.** Mr. Hawkins was responsible for editing the final version of the document, based on changes made to the final Army Corp of Engineers Project EIS.

California Public Utilities Commission (CPUC). Mr. Hawkins has assisted with the research, analysis, and production of the CPUC's CEQA review process for the following transmission line projects:

- **Sunrise Powerlink Project EIR/EIS, San Diego County, CA.** Mr. Hawkins coordinated the preparation of the Environmental Justice analysis, using GIS and census data to determine the potential for low-income and minority populations to be impacted by the construction of hundreds of miles of 230 kV and 500 kV transmission lines. Mr. Hawkins also provided consistency review and editing of analysis sections following changes made to the project alternatives.
- **Riverway Substation Project, City of Visalia and Tulare County, CA.** Mr. Hawkins performed the agricultural resources, land use, population and housing, public services, recreation, and utilities and service systems analyses for this substation, transmission, and distribution project in the Visalia and unincorporated Tulare County.
- **El Casco System Project EIR, Riverside and San Bernardino Counties, CA.** Mr. Hawkins prepared the Initial Study for the construction of a new substation, new transmission line, and new fiber optic line, as well as upgrades to existing transmission lines and substations in the Cities of Redlands, Yucaipa, Banning, and Beaumont and unincorporated Riverside County. This Initial Study was used to determine that significant, unavoidable impacts would result from the project and an EIR would be necessary. Mr. Hawkins prepared the Land Use analysis for the EIR, which also included the evaluation agricultural resources and recreation impacts.

- **Tehachapi Renewable Transmission Project EIR/EIS, Kern, Los Angeles, and San Bernardino Counties, CA.** Mr. Hawkins prepared the Agricultural Resources staff report and EIR/EIS agricultural resources analysis for this transmission project which includes the construction and modification of new and existing substations and transmission lines in Kern, Los Angeles, and San Bernardino Counties, traversing 22 cities as well as Angeles National Forest.
- **Devers–Palo Verde No. 2 Transmission Line Project EIR/EIS, CA and AZ.** As a Deputy Project Manager, Mr. Hawkins oversaw the preparation of an EIR/EIS for the CPUC and BLM, assessing the impacts of a 230-mile 500 kV transmission line between SCE's Devers Substation in California to the Harquahala switchyard outside the Palo Verde Nuclear Generating Station in Arizona. Mr. Hawkins coordinated, reviewed, and edited the impact analyses and contributed to the development of the project and alternative descriptions.
- **Antelope-Pardee 500 kV Transmission Line Project EIR/EIS, Los Angeles County, CA.** Mr. Hawkins coordinated the Socioeconomics and Environmental Justice, Utilities, Public Services, and Forest Management analyses for this EIR/EIS which evaluated the impacts of construction of a 25.6-mile 500 kV transmission line between SCE's Antelope and Pardee substations and traverses Angeles National Forest. Mr. Hawkins also assisted with the review and editing of the other social science sections.
- **Antelope Transmission Project, Segments 2 & 3 EIR, Los Angeles and Kern Counties, CA.** Mr. Hawkins prepared the property value and EMF appendices for this EIR which evaluated the impacts of construction of two new substations, a 21.0-mile 500-kV transmission line, a 0.5-mile 220-kV transmission line, a 25.6-mile 500-kV transmission line, and a 9.6-mile 220-kV transmission line. Mr. Hawkins also prepared the environmental justice section, the response to comments, and review and editing of the other social science sections.
- **SONGS/Diablo Canyon Steam Generator Replacement Project EIRs, San Diego and San Luis Obispo Counties, CA.** Mr. Hawkins coordinated the Socioeconomics and Public Services and Utilities analyses for the EIR to replace the steam generators at SCE's San Onofre Nuclear Generating Station near San Clemente in San Diego County, as well as for a similar EIR for the Diablo Canyon nuclear power plant near San Luis Obispo. Mr. Hawkins performed the Socioeconomics and Public Services and Utilities analyses and reviewed and edited the Land Use section.
- **Looking Glass Networks Fiber Optic Cable Project IS/MND, northern and southern California.** Mr. Hawkins evaluated the potential Land Use and Recreation impacts for the proposed installation and upgrade of hundreds of miles of fiber optic telecommunication networks in the San Francisco Bay Area and Los Angeles Basin Area. He coordinated and edited the Biological Resources, Geological Resources, and Hazards and Hazardous Materials sections of the IS/MND.
- **Jefferson-Martin Transmission Line EIR, San Mateo County, CA.** Mr. Hawkins conducted surveys of proposed 27-mile transmission line route and prepared the recreation, utilities, and public service uses. He assisted in cataloging and categorizing over 300 scoping comments which helped to shape the alternatives development for the project. He evaluated key recreation impacts associated with this project, including using GIS to determine potential impacts, and analyzed socioeconomic, housing, employment, tax-base, public utility, education, and public service issues in the affected area. He was also involved in editing and reviewing the draft and final EIRs.
- **Viejo System Project IS, Orange County, CA.** Mr. Hawkins conducted site surveys of the recreation areas along the 3-mile transmission line corridor and prepared the recreation impact assessment for the IS. The project involves the proposed replacement of a string of TSP transmission towers with H-frame towers, enabling the addition of a new 66 kV line in an existing transmission corridor which follows open space and recreation areas along its length. Mr. Hawkins also assisted with reviewing and editing other social science sections of the IS.

- **Miguel-Mission 230 kV #2 Transmission Line Project EIR, San Diego County, CA.** Mr. Hawkins coordinated the preparation of the social science impact analyses, including Land Use, Public Services and Utilities, Socioeconomics, and Recreation. The project involved reconductoring a series of transmission towers in San Diego County, as well as adding additional towers to extend a portion of the transmission line. Mr. Hawkins assisted with the preparation and production of the EIR by performing a final review on the impact analysis sections.

Department of Water Resources (DWR). Mr. Hawkins has assisted with the analyses and preparation of CEQA documentation, as well as the permitting for the following DWR projects:

- **Piru Creek Flows EIR, Los Angeles County, CA.** Mr. Hawkins acted as the Deputy Project Manager for this project, coordinating the preparation of the environmental analyses as well as performing the recreation analysis. Under the project, DWR proposed to modify the flow release regime for Pyramid Dam under their Federal Energy Regulatory Commission (FERC) license. This modification has the potential to affect endangered and threatened species on Piru Creek below the dam as well as trout habitat and recreational fishing areas. Mr. Hawkins assisted in the preparation of an EIR to analyze the potential impacts to these resources, performing the Recreation analysis as well as reviewing and editing other portions of the document.
- **Pyramid Lake Repair EIR, Los Angeles County, CA.** As the Deputy Project Manager, Mr. Hawkins coordinated the composition of the CEQA Notice of Exemption for proposed repairs and renovations to facilities on Pyramid Lake. In addition to coordination activities for the CEQA NOE, Mr. Hawkins is assisted with permitting efforts by acting as a liaison between Aspen and the DWR, Department of Boating and Waterways, and other government agencies.
- **Santa Ana River Valley Pipeline Repair Project Categorical Exemptions, San Bernardino and Riverside Counties, CA.** Mr. Hawkins prepared two categorical exemption memos for the DWR, the first time acting as Deputy Project Manager and the second time, managing the project on his own. Mr. Hawkins conducted numerous site visits and coordinated the environmental analyses performed in support of the project's CEQA Class 1 and 2 Categorical Exemption documentation. The project involves the repair and replacement of sections of the east branch of the California Aqueduct. As the project involved only maintenance and repair activities, it was applicable for a categorical exemption. Mr. Hawkins also assisted the DWR by providing permitting and contractor interaction support, acting as a liaison with local flood control agencies to acquire project permits, attending contractor pre-bid meetings, and preparing punch-lists for construction monitors.
- **Piru Creek Erosion Repairs and Bridge Seismic Retrofit Project IS/MND, Los Angeles County, CA.** Mr. Hawkins prepared the project description and assisted with the coordination of the technical analyses for preparation of the IS/MND. The project involved the repair of three flood control structures along Piru Creek and the seismic retrofit of the Pyramid Dam Bridge.

State Lands Commission – Mr. Hawkins has assisted with the analyses and preparation of CEQA and NEPA documentation, as well as the permitting for the following State Lands Commission projects:

- **Kinder Morgan Concord-Sacramento Pipeline EIR.** Mr. Hawkins was responsible for the development of a GIS to map the Kinder Morgan Pipeline over socioeconomic and demographic census data to perform an environmental justice analysis. He assisted in the preparation of the socioeconomics and environmental justice EIR sections, analyzing demographics, income levels, housing, employment, education, and tax-base within the affected region.
- **Monterey Accelerated Research System (MARS) Cabled Observatory EIS/EIR.** Mr. Hawkins assisted with preparation of the project description as well as other required CEQA and NEPA sections for the MARS Cabled Observatory project, which would install a 51 km cable along the seafloor of the Monterey Bay from the Monterey Bay Aquarium Research Institute to a science node installed at a depth of 1 km beneath the ocean surface.

City of Banning – Mr. Hawkins is managing the CEQA documentation for a number of power generation and transmission projects for the City of Banning's Electric Utility Department. Consequently, he oversees the preparation and production of the CEQA documents, provides final QA/QC on the documents, tracks the budget and project progress. Mr. Hawkins has been involved in the following City of Banning projects:

- **Sunset Substation and Transmission and Distribution Project IS and MND, Banning, CA.** Mr. Hawkins has managed the preparation and production of the IS and MND for this 2-acre substation, 33 kV subtransmission lines, and 12 kV distribution lines in the City of Banning. He has coordinated analyses to determine the necessary biological surveys and water quality permitting. With the certification of the IS/MND, Mr. Hawkins has coordinated pre-construction surveys in preparation of the project commencement.
- **Liberty XXIII Renewable Energy Power Plant Project EIR, Banning, CA.** Mr. Hawkins assembled a team of specialists to prepare an EIR for this 15 MW biomass- and biosolids-fueled power plant in the City of Banning. With the assistance of the City, Mr. Hawkins prepared the Project Description and in coordination with the City and Liberty Energy is developing Alternatives for the project. Mr. Hawkins has coordinated a series of visits to the project site for the technical specialists as well as the preparation and distribution of data requests and responses, acting as a liaison with the City and Liberty Energy. Mr. Hawkins managed the preparation and production of the EIR and attended a series of public meetings discussing the findings of the document.

Western Area Power Authority – Mr. Hawkins worked on social science analyses on the following of Western's environmental documents:

- **North Area Environmental Assessment, CA.** Mr. Hawkins prepared the Land Use and Recreation sections for an EA evaluating the impacts of maintenance activities on hundreds of miles of transmission lines ranging from California's central valley to the Oregon border. As production of the document approached, Mr. Hawkins also reviewed and edited the Noise and Transportation sections of the EA.
- **Sacramento Valley Voltage Support EIS Project, CA.** Mr. Hawkins prepared and coordinated the preparation of the Visual Resources, Environmental Justice, Noise, and Socioeconomics sections for maintenance and new construction of 108 miles of transmission lines in Sutter, Sacramento, Placer, San Joaquin, Contra Costa, and Alameda Counties.

Los Angeles Department of Water & Power (DWP). Mr. Hawkins has performed a variety of tasks for the DWP, ranging from fact-checking and project description development to management activities. Mr. Hawkins has been involved in the following DWP projects:

- **Taylor Yard Water Recycling Project IS/MND.** Mr. Hawkins acted as Deputy Project Manager for this project which included the installation of approximately two miles of 16-inch recycled water pipeline in the Cities of Glendale and Los Angeles. Mr. Hawkins coordinated the preparation and review of the project analysis and assisted with production of the document.
- **Pine Tree Wind Development Project EIR/EA, Kern County, CA.** Mr. Hawkins reviewed the EIR/EA prepared for this wind energy generation project consisting of 80 1.5 MW wind turbine generators and compared the project components listed in the EIR/EA with revised project components described by DWP's contractor and the DWP. Mr. Hawkins prepared a report specifying the discrepancies and inconsistencies between the documents for DWP.

City of Colton – North Substation Project IS/MND. Mr. Hawkins managed the preparation and production of the IS/MND for the construction of a 2-acre electrical substation, a 69 kV subtransmission line, and 12 kV distribution circuits. Mr. Hawkins conducted a town hall meeting and two public comment meetings for the IS/MND. Mr. Hawkins will also be attending the City's Planning Commission and City Council meetings to discuss the project with City officials.

County of Kern – Alta-Oak Creek Mojave Project EIR. Mr. Hawkins prepared the agricultural and recreation resources analyses for this approximately 9,300-acre, 350-turbine wind farm. This project would be constructed across thousands of acres of grazing land as well as the Pacific Crest Trail. Mr. Hawkins evaluated how the project would affect recreational users of both the Pacific Crest Trail as well as other nearby recreation areas.

County of Ventura – Upper San Antonio Creek Watershed Giant Reed Removal Project IS/MND. Mr. Hawkins prepared the public health analysis for this project which proposed to remove giant reed and castor bean from the Upper San Antonio Creek Watershed using a combination of cutting and herbicide. Mr. Hawkins evaluated the health effects of the use of glyphosate-based herbicide on both the public in the vicinity of the project as well as on workers conducting the vegetation removal activities. As part of this, Mr. Hawkins developed mitigation measures to minimize impacts to sensitive receptors associated with exposure to the glyphosate.

County of San Luis Obispo. Mr. Hawkins is preparing social science and economic analyses for the following of San Luis Obispo County's environmental documents: :

- **Topaz Solar Farm EIR.** Mr. Hawkins is preparing the public services and utilities analysis for this 550-MW solar facility spanning over 6,200 acres in the Carrizo Plain. Additionally, he will be performing an economic analysis to determine the impact of the Topaz Solar Farm along with the California Valley Solar Ranch and Carrizo Energy Solar Facility on San Luis Obispo County. He will be contacting local public service agencies to determine impacts the project might have and potential costs that would not be covered by property tax revenues.
- **California Valley Solar Ranch EIR.** Mr. Hawkins is preparing the public services and utilities analysis for this 250-MW solar facility spanning over 2,000 acres in the Carrizo Plain. Additionally, he will be performing an economic analysis to determine the impact of the California Valley Solar Ranch along with the Topaz Solar Farm and Carrizo Energy Solar Facility on San Luis Obispo County. He will be contacting local public service agencies to determine impacts the project might have and potential costs that would not be covered by property tax revenues.

Sonoma-Marin Area Rail Transit District - Sonoma-Marin Area Rail Transit EA. Mr. Hawkins oversaw the preparation of the environmental justice analysis for this approximately 70-mile rail line from Cloverdale, at the north end of Sonoma County, to Larkspur, where the Golden Gate Ferry connects Marin County with San Francisco, with stations at the major population centers of the North Bay. In addition to developing the mapping necessary for the analysis, Mr. Hawkins supervised the analysis and reviewed and edited the environmental justice section for the EA.

Transmission Agency of Northern California – TANC Transmission Project. Mr. Hawkins assisted in the scoping process for the construction and upgrade of approximately 600 miles of 230- and 500-kV transmission line throughout northern California. Mr. Hawkins summarized almost 400 public comments for inclusion in the project's scoping report.

Palmdale Water District – Littlerock Reservoir Sediment Removal Project EIR/EIS. As the Deputy Project Manager, Mr. Hawkins worked with staff and the Palmdale Water District project manager to develop the Purpose and Need and Project Description for the EIR/EIS evaluating the impact of the construction of a grade control structure upstream of the reservoir and excavation of sediment from the reservoir. Mr. Hawkins prepared the Land Use and Recreation analyses as well as the Long-Term Implications and Environmental Justice sections. Additionally, he coordinated, reviewed, and edited the environmental analyses for the Administrative Draft EIR/EIS. Using material from the EIR/EIS, he has also assisted Palmdale Water District with the preparation of their grant application for Littlerock Dam.

West Basin Municipal Water District (WBMWD) QA/QC. Mr. Hawkins performed QA/QC for WBMWD's Montebello Loop IS which was prepared for a recycled water pipeline to be constructed from the City of Pico Rivera through unincorporated Los Angeles County to the City of Montebello.

USDA Angeles National Forest (ANF) - Fuel Management BEBAs. In preparation for the 2005 fire season, the Forest Service developed a Fuel Management plan that required fuel modification at approximately 116 different sites within the ANF. For each site requiring fuel modification, a BEBA needed to be prepared to assess the biological impacts of the action. Mr. Hawkins worked with staff to develop a systematic methodology for preparing this large number of BEBAs in a short period. Although a framework to incorporate the survey results with CNDDB and species data was developed, each BEBA required an individual analysis of the impacts, which Mr. Hawkins drafted.

Bureau of Land Management (BLM) – San Juan-Chama Water Contract Amendments with City/ County of Santa Fe, County of Los Alamos, Town of Taos, Village of Taos Ski Valley, Village of Los Lunas, and City of Española EA. The City/County of Santa Fe, County of Los Alamos, Town of Taos, Village of Taos Ski Valley, Village of Los Lunas, and City of Española currently have water service contracts with the BLM, which must be renewed every 40 years. Under the contract amendment, these jurisdictions contracts would be converted to repayment contracts which would not need to be renewed. Mr. Hawkins acted as the Deputy Project Manager for preparation of an EA for the project. He prepared materials for and attended public scoping meetings and coordinated revisions to a Draft EA prepared by the BLM for this project in 2003.

Department of Oil, Gas, and Geothermal Resources (DOGGR). Mr. Hawkins prepared a data gap analysis to determine if the documents collected by DOGGR for Kern County have sufficient information and to outline any additional data necessary to complete the public services and utility sections of a CEQA review document. Upon completing the data gap analysis, he prepared the public services and utility sections of the IS for its publication.

California Institute of Technology/Owens Valley Radio Observatory – Combined Array for Research in Millimeter-wave Astronomy (CARMA) EIS/EIR. Mr. Hawkins assisted with the vegetation analysis for the CARMA EIS/EIR by developing a GIS to model the potential impacts the project would have on different vegetation communities surrounding the proposed radio telescope. Project construction includes the development of a central telescope array and between 18 and 19 antenna arrays and associated transportation infrastructure within the Inyo National Forest, requiring a Special Use Permit. Mr. Hawkins used field data to model and calculate in the GIS the potential habitat of special status species that could be impacted by the project and compare it to recorded locations of special status species.

Las Virgenes Municipal Water District – Calabasas Pipeline. Mr. Hawkins assisted with a biological survey of the pipeline creek crossing adjacent to the Santa Monica Mountain National Reserve and assisted in determining the necessary permits, approvals, and mitigations necessary for the proposed creek crossing. He also prepared a subsequent biological report used as the basis for the biology section in a CEQA review document.

City of Laguna Niguel – Upper Sulphur Creek Ecosystem Restoration Project MND and IS. Mr. Hawkins acted as the Deputy Project Manager for the CEQA compliance for this 1.52-mile creek restoration project along a residential area in the City of Laguna Niguel. Mr. Hawkins developed the project description and coordinated the preparation of the MND and IS. Acting as a liaison with the City of Laguna Niguel, he arranged for public notification, preparation of the document, response to public comments, and submission to the State Clearinghouse.

County of San Diego – Otay River Watershed Management Plan (WMP). Mr. Hawkins researched the land use and socioeconomic characteristics of the San Diego County area within the Otay River WMP boundaries that could be used as indicators for a metric of watershed health. The Otay River WMP is being developed as an implementation strategy to ensure the protection of beneficial uses and natural resources within the plans' boundaries. Mr. Hawkins prepared a socioeconomic and land use indicators white page for use with the Otay River WMP.

ADDITIONAL TRAINING

- Karrass Effective Negotiation Two-Day Seminar, *Karrass LTD., San Jose, CA*, January 1998.
- California Environmental Quality Act (CEQA) Two-Day Workshop, *UC Santa Barbara Extension Course*, September 2001.

DECLARATION OF
Steve Baker

I, Steve Baker, declare as follows:

1. I am presently employed by the California Energy Commission in the Engineering Office of the Siting, Transmission and Environmental Protection Division as a Senior Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Noise and Vibration**, and supervised preparation of the staff testimony on **Power Plant Efficiency, Power Plant Reliability, Facility Design** and **Geology and Paleontology**, for the GWF Tracy Combined Cycle Power Plant Project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: July 27, 2009 Signed: Original signature in Dockets

At: Sacramento, California

STEVE BAKER, P.E.
Senior Mechanical Engineer

Experience Summary

Thirty-five years experience in the electric power generation field, including mechanical design, QA/QC, construction/startup and business development/licensing of nuclear, coal-fired, hydroelectric, geothermal and windpower plants; and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Long Beach--Master of Business Administration
- California State Polytechnic University, Pomona--Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California —
  No. M27737 expires 6/30/2010

Professional Experience

1990 to Present--Senior Mechanical Engineer, Facilities Siting Division - California Energy Commission

Technical lead person for the analysis of generating capacity, reliability, efficiency, noise, geology, paleontology and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases. Key contributor to Commission's investigation into market impediments to the deployment of advanced high-efficiency generating technologies.

1987 to 1990--Generation Systems/Facility Design Unit Supervisor, Siting & Environmental Division - California Energy Commission

Responsible for supervising the analysis of generating capacity, reliability, efficiency, safety, and mechanical, civil/structural, and geotechnical engineering aspects of power plant siting cases.

1981-1986--Operations Manager, Alternate Energy - Santa Fe Pacific Realty Corporation

Participated in and supervised identification, evaluation and feasibility analysis, licensing and permitting of hydroelectric, geothermal, windpower and biomass power projects.

1974-1981--Mechanical Engineer, Quality Engineer - Bechtel Power Corporation and Bechtel National, Inc.

Wrote equipment specifications, drew flow diagrams and P&ID's, performed system design and safety analysis for nuclear power plants and nuclear fuel processing plant. Wrote and implemented QA/QC procedures for nuclear power plant. Participated in construction/startup of large coal-fired power plant.

DECLARATION OF
Vince C. Geronimo, PE

I, Vince Geronimo, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Energy Facilities Siting Division as a Soil & Water Resources Specialist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Soil & Water Resources, for the GWF Tracy Combined Cycle Power Plant Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: September 17, 2009 Signed: Original signature in Dockets

At: Sacramento, California

Vince C. Geronimo, PE, CFM

Associate Principal

Vince Geronimo is a registered California Professional Civil Engineer with 14 years of experience in the field of civil, environmental, and water resources engineering. Mr. Geronimo specializes in the planning, design, and implementation of flood mitigation projects that integrate ecosystem restoration. As part of PWA's fluvial team Mr. Geronimo provides technical QA/QC review of hydrologic and hydraulic analyses. Mr. Geronimo manages PWA's IDIQ contract with FEMA Region IX. For the California Energy Commission, Mr. Geronimo has conducted CEQA analysis, recommended mitigation measures, and contributed to Staff Assessments on four siting cases. Mr. Geronimo has conducted various environmental compliance reviews for more than 20 energy facilities. His education and project experience includes wastewater treatment facility design, water transmission and storage analysis, economic analysis, sediment and erosion control planning, stream and wetland restoration, and design of hydraulic structures. As a Certified Floodplain Manager and an engineer, Mr. Geronimo is knowledgeable of methods, to employ, that help reduce flood losses and protect and enhance the natural resources and functions of floodplains.

Education	M.S., 2004	Civil Engineering, Water Resources Emphasis, University of Colorado - Denver, Colorado
	B.S., 1995	Civil Engineering, Environmental Emphasis, Southern Illinois University - Edwardsville, Illinois
Professional Registration	2001 2006	Professional Engineer, State of Colorado, 35224 Civil Engineer, State of California, 70165
Certifications	2002	Certified Floodplain Manager, Certificate No. US-02-00543, Association of State Floodplain Managers
Memberships		American Society of Civil Engineers Environmental & Water Resources Institute of ASCE-Sacramento (Treasurer) Association of State Floodplain Managers Floodplain Managers Association

Selected Project Experience

Beacon Solar Energy Plant; Kern County, CA 2005 -Present. PWA Project Manager provided environmental review for the California Energy Commission of a proposed solar energy plant in the Mojave desert. The environmental review focused on the stormwater, BMPs, and flood related impacts. Mr. Geronimo conducted hydrologic, hydraulic, and geomorphic analyses to assess the project plan to divert an existing dry wash through a constructed earthen diversion channel. Mr. Geronimo provided environmental review of the Storm Water Pollution Prevention Plan and the Drainage Erosion and Sediment Control Plan (DESCP). Mr. Geronimo authored the stormwater and flood related portions of the Preliminary Staff Assessment which included an engineer's evaluation of the project in a separate appendix.

GWF Tracy; Tracy, CA 2008 – Present. PWA Project Manager provided environmental review of a proposed combined-cycle power plant in the City of Tracy for the California Energy Commission. The environmental review focused on the impacts to soil and water use. Mr. Geronimo specifically reviewed the project's proposed stormwater related facilities, BMPs, the septic facility, and water use to evaluate potential soil and water impacts. Mr. Geronimo conducted an assessment of the availability of recycled water and provided oversight for the Soil and Water Section of the Preliminary Staff Assessment.

Compliance Reviews; Throughout California. 2006 – Present. PWA Project Manager responsible for compliance reviews for the California Energy Commission. Mr. Geronimo is a technical reviewer for Soil & Water and Waste compliance submittals. Mr. Geronimo reviews Storm Pollution Prevention Plans (SWPPPs), Drainage Erosion and Sediment Control Plans (DESCP), water use, monthly/annual compliance reports, and flood related compliance submittals to determine if the Project remains in compliance with the Conditions of Certification specified in the Energy Commission's licensing decision.

Selected Project Experience
(Continued)

San Francisco Electric Reliability Plant; San Francisco, CA 2005 -Present. PWA Assistant Project Manager provided environmental review of a proposed power plant in San Francisco for the California Energy Commission. The environmental review was focused on the impacts to soil and water use. Mr. Geronimo specifically reviewed potential flooding, water reclamation and re-use, tertiary wastewater treatment facility, water quality impacts related soil erosion, and the Storm Water Pollution Prevention Plan and storm water best management practices.

Inland Empire Energy Center; Romoland, CA 2005. PWA Assistant Project Manager provided environmental review of a proposed power plant in Romoland for the California Energy Commission. The environmental review was focused on the impacts to soil and water use. Specific analyses included assessing potential flooding, water quality impacts related soil erosion, and the Storm Water Pollution Prevention Plan and storm water BMPs.

South Bay Salt Ponds Restoration Project, For the California State Coastal Conservancy, 2004 – 2008. PWA Task Manager for the riverine analysis of the Guadalupe River/Alviso Slough system. The analysis supported the EIR/S documentation for the South Bay Salt Pond Restoration Project NEPA/CEQA environmental review processes. The analysis combined a steady-state HEC-RAS model and an unsteady UNET model to test a combination of flooding scenarios related to the project alternatives that reduce offline storage and improve conveyance. The South Bay project is approximately 15,000 acres and will restore and enhance wetland habitats, improve public access and reduce flood hazards.

Independent QA/QC Review; FEMA Region IX, 2005 - 2008, PWA Project Manager responsible for developing the QA/QC procedures and checklist to provide independent review of three FEMA Flood Insurance Restudies within Monterey County, Siskiyou County, and Placer County. The independent technical review was conducted in accordance with the established policy principles and procedures in the *Guidelines and Specifications for Flood Hazard Mapping Partners*. The technical review included: Topographic Data, Hydrologic Data, Hydraulic Data, Floodplain Mapping (Revised Areas), as well as secondary checks of the data submitted as part of the TSDN for each re-study.

Flood Insurance Re-Studies; **FEMA Region IX**, 2007 - Present, PWA Project Manager responsible for managing a Marin County (Ross Valley) and a Santa Cruz County (Watsonville) Flood Insurance Re-study of several creeks in the study areas. The re-studies include: field survey, topographic mapping, hydrologic and hydraulic modeling, flood hazard assessment, and floodplain mapping.

Newhall Ranch Development, Valencia, CA, 2006-2008. For Newhall Land and Farming Company. Led the hydraulic assessment and conceptual civil design for improving five tributaries of the Santa Clara River that will be subject to hydromodification. Mr. Geronimo developed a suite of channel stabilization and bank stabilization application methods and design criteria to achieve stable channel morphology in response to reductions in sediment delivery and increases in flow.

Contra Costa Clean Water Program Hydrograph Modification Management Plan – Project Engineer, 2006-2007; for Contra Costa Clean Water program. Mr. Geronimo was part of the consultant team to assist the Contra Costa Clean Water Program in developing a Hydrograph Modification Management Plan (HMP). The HMP will include standards and performance criteria for hydrograph modification management by new development projects. Mr. Geronimo was involved in developing engineering concepts and practical civil design for Integrated Maintenance Practices (IMP).

Lake Sonoma Water Diversion; Sonoma County, CA 2005, PWA Project Manager to study feasibility of diverting water from Lake Sonoma, to the Russian River. The purpose of the analysis was for an EIR scoping process. Mr. Geronimo performed a reconnaissance level, engineering evaluation and provided an approximate cost to deliver 26,000 acre-feet of water from Lake Sonoma to the Russian River. The summary cost estimate included: facilities cost, approximate electrical demand engineering costs as percentage of facilities cost.

DECLARATION OF
Rachel Cancienne, EIT

I, Rachel Cancienne, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Energy Facilities Siting Division as a Soil & Water Resources Specialist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Soil & Water Resources, for the GWF Tracy Combined Cycle Power Plant Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: September 17, 2009 Signed: Original signature in Dockets

At: Sacramento, California

Rachel M. Cancienne, MS

Hydrologist

Ms. Cancienne is a hydraulic and environmental engineer with experience in river dynamics and streambank stability. She received her Master of Science degree in Biosystems Engineering with an emphasis in Natural Resources from Oklahoma State University, where she was a student of Dr. Garey Fox. She conducted laboratory research on simulated streambanks and used numerical modeling through USDA-ARS National Sedimentation Laboratory software to study streambank stability. Since joining PWA's Fluvial Team, she has focused on hydraulic modeling and soil and water analyses for the California Energy Commission.

Education

M.S. 2008 — Biosystems and Agricultural Engineering
Emphasis in Environment and Natural Resources
Oklahoma State University, Stillwater, OK

B.S. 2006 — Biosystems and Agricultural Engineering
Oklahoma State University, Stillwater, OK

Certifications

Engineer in Training (EIT), OK License: EI 13655

Honors/Awards

Tau Beta Pi Engineering Honor Society, 2006—2008
Alpha Epsilon, Biosystems Engineering Honor Society, 2005—2008
National Society of Collegiate Scholars, 2003—2008
Phi Eta Sigma Freshman Honor Society, 2002—2003
Boy Scouts of America Venturing Leadership Award, 2002

Selected Project Experience

GWF Tracy; Tracy, CA 2008 – Present. Ms. Cancienne provided environmental review of a proposed combined-cycle power plant in the City of Tracy for the California Energy Commission. The environmental review focused on the impacts to soil and water use and included writing a Staff Assessment. Ms. Cancienne specifically reviewed the project's proposed stormwater related facilities, BMPs, and water use to evaluate potential soil and water impacts. Ms. Cancienne provided extensive written input for the Soil and Water Section of the Preliminary Staff Assessment.

Almond 2 Power Plant, Turlock Irrigation District, Turlock, CA 2009 - Present. Ms. Cancienne provided environmental review for a proposed power plant project by the Turlock Irrigation District for the California Energy Commission. The environmental review focused on the impacts to soil and water use, submittal and review of data requests, and included writing a Staff Assessment. Ms. Cancienne specifically reviewed the project's proposed stormwater related facilities, BMPs, and water use to evaluate potential soil and water impacts. Ms. Cancienne provided extensive written input for the Data Requests and Soil and Water Section of the Preliminary Staff Assessment.

DWR-San Joaquin Non-Urban Levees, San Joaquin Valley, CA, 2008 – present. Hydrologist. Ms. Cancienne reviewed and digitized historic topographic maps and aerial photos using ArcGIS 9.2. Developed mapping products which included geologic and soils data, as well as a written report, to aid client's knowledge of potential levee instability locations.

DWR Geomorphic Study, Urban Non-Project, Stockton, 2008 – Present. Hydrologist. Ms. Cancienne reviewed and digitized historic topographic maps and aerial photos using ArcGIS 9.2. Developed mapping products which included geologic and soils data, as well as a written report, to aid client's knowledge of potential levee instability locations.

Whidbey Island NAS Mitigation and Stormwater Planning, Whidbey Island, WA, 2008. Hydrologist. PWA is developing a Stormwater Management Plan for a

proposed airfield expansion at the Whidbey Island Naval Air Station at Whidbey Island in Puget Sound, Washington. The project involves hydromodification modeling to assess the potential impact to receiving waters as a result of potential runoff impacts due to an increase in impervious area. The Stormwater Management Plan also involves field data collection of flows and channel bathymetry, hydrologic and hydraulic modeling, and development of alternatives for mitigating potential hydromodification, including Best Management Practices (BMPs). Ms. Cancienne performed HEC-RAS analysis for re-designed channel through mitigation site.

Relevant Experience

Graduate Research Assistant, Oklahoma State University, Stillwater, OK. 2007
Under advisor, Dr. Garey A. Fox, Ms. Cancienne directed and performed experimental analyses involving streambank stability; simulated stability of streambanks using the USDA-ARS Bank Stability and Toe Erosion (BSTEM) model; and reviewed and wrote detailed reports and manuscripts regarding research procedures and findings. Graduate Thesis: *Influence of Seepage Undercutting on the Root Reinforcement of Streambanks*

Graduate Teaching Assistant, Oklahoma State University, Stillwater, OK. 2007
Under advisor, Dr. Glenn Brown, Ms. Cancienne led a discussion section of 25 students for ENSC 3233: Fluid Mechanics.

NSF-REU Life Science/Engineering Program Intern, Texas A&M University, College Station, TX. 2006 Gained undergraduate research experience in the development of dissolved oxygen sensors for fluctuating aquatic environments.

Drilling-Completion Operations Intern, Cimarex Energy Co., Tulsa, OK. 2005
Compiled and assessed patterns associated with drilling processes and expenditures from expired drilling reports.

Publications

Cancienne, R., G.A. Fox, and A. Simon. 2008. Influence of seepage undercutting on the root reinforcement of streambanks. *Earth Surface Processes and Landforms* (In Press).

Cancienne, R., G.A. Fox, and G.V. Wilson. 2008. Vegetated Soil Block Experiments Investigating Three-Dimensional Seepage Erosion Phenomena. Proceedings of the American Society of Agricultural and Biological Engineers Annual Conference, June 29-July 2, 2008.

DECLARATION OF
Testimony of Scott Debauche

I**, Scott Debauche,** declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as a **Transportation and Traffic Technical Specialist**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transportation and Traffic** for the **GWF Tracy Combined Cycle Power Plant** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: July 30, 2009 Signed: Original signature in Dockets

At: Agoura Hills, California

SCOTT DEBAUCHE

Environmental Planner

ACADEMIC BACKGROUND

B.S., Urban & Regional Planning, University of Minnesota, 1994

PROFESSIONAL EXPERIENCE

Mr. Debauche is an environmental planner with 14 years of experience preparing a variety of federal and State of California environmental, planning, and analytical documents for large-scale infrastructure and development projects. Mr. Debauche brings the experience of specializing in the integration and completion of NEPA and CEQA documentation joint documentation. Mr. Debauche specializes in evaluating Transportation/Traffic, Noise, Socioeconomics and Environmental Justice, Air Quality, Alternatives analysis, and public and community involvement programs.

Aspen Environmental Group — 2001 to present

- **TANC Transmission Project (TTP) EIR/EIS, several Northern California Counties.** Mr. Debauche is currently serving as the Technical Specialist in charge of preparation of the EIR/EIS Transportation/Traffic and Socioeconomics CEQA/NEPA analysis. The Transmission Agency of Northern California (TANC) and Western Area Power Administration (Western), an agency of the U.S. Department of Energy (DOE), are the CEQA lead agency and NEPA lead agency, respectively. The TTP generally would consist of new and upgraded 500 kilovolt (kV) and 230 kV transmission lines, substations, and related facilities generally extending from northeastern California near Ravendale in Lassen County to the California Central Valley through Sacramento and Contra Costa Counties and westward into the San Francisco Bay Area.
- **Alta Wind Project EIR, Kern County, CA.** Mr. Debauche is the Technical Specialist for Transportation/Traffic, Noise, and Air Quality for this EIR. The applicant, Alta Windpower Development, LLC, proposes to develop the Alta-Oak Creek Mojave Project (proposed project or project) for the commercial production of up to 800 Megawatts (MW) of electricity from wind turbines. The proposed project would result in construction of up to 350 wind turbine generators, their ancillary facilities and supporting infrastructure located on three distinct land areas comprising a total of approximately 10,750 acres located approximately 3 miles west of State Route (SR) 14 (Antelope Valley Freeway) and 3 miles south of SR-58 in the Willow Springs area of eastern Kern County.
- **Littlerock Reservoir Sediment Removal Project EIS/EIR, Palmdale, CA.** Mr. Debauche is the Technical Specialist for Transportation/Traffic, Noise, and Socioeconomics for this joint EIS/EIR evaluating the impacts of sediment removal alternatives for the Littlerock Reservoir and Dam on USFS Angeles National Forest (NEPA Lead Agency) lands in Los Angeles County. The project involves impacts to the arroyo toad, extensive coordination with USFWS for a Section 7 consultation, incorporation of new Forest Service Plan updates and requirements into the analysis, preparation of the Forest Service required BE/BA, and analysis of compliance with federal conformity requirements. Aspen is currently working on the Administrative Draft EIR/EIS and assisting the PWD with portions of their Proposition 50 grant application to the DWR.

- **Baldwin Hills Oil Field Community Standards District EIR Review and Ordinance Preparation, Culver City, CA.** Mr. Debauche served as the Technical Specialist for the City of Culver City reviewing the Los Angeles County Baldwin Hills Oils Field Community Standards District EIR Noise analysis evaluating the impacts of expanding the existing Baldwin Hills oil field. Once completed, Mr. Debauche then prepared the Noise section of the newly enacted City of Culver City Community Standards District overlay zone restricting noise generation by the Baldwin Hills Oil Field on the residents of Culver City.
- **Long Beach LNG Import Project, Long Beach, CA.** Under contract to the City of Long Beach, Aspen was tasked to review the Draft EIS/EIR for the proposed construction and operation of this onshore Liquified Natural Gas facility to be located at the Port of Long Beach. Mr. Debauche reviewed the document for technical adequacy and assisted the City in preparing written comments for the following sections of the EIS/EIR: Transportation/Traffic and Noise.
- **Sunset Substation and Transmission and Distribution Project CEQA Documentation, Banning, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for this EIR. The City of Banning proposes to construct the Sunset Substation and supporting 33-kilovolt (kV) transmission line that would interconnect with the City's existing distribution system. The purpose of this new substation and transmission is to relieve the existing overloads that are occurring within the City's electric system and to accommodate projected growth in the City.

California Public Utilities Commission (CPUC). Under Aspen's environmental services contract with the CPUC, Mr. Debauche has prepared environmental analysis sections of environmental reports analyzing large-scale infrastructure projects. His project experience with the CPUC includes the following:

- **Tehachapi Renewable Transmission Project (TRTP) EIR/EIS, Kern, Los Angeles, and San Bernardino Counties, CA.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Mr. Debauche is currently serving as the Technical Specialist for Noise and Alternatives evaluation for SCE's proposal to construct, use, and maintain a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity generated from new wind energy projects in eastern Kern County. Approximately 46 miles of the project would be located in a 200- to 400-foot right-of-way on National Forest System land (managed by the Angeles National Forest) and approximately three miles would require expanded right-of-way within the Angeles National Forest. The proposed transmission system upgrades of TRTP are separated into eight distinct segments: Segments 4 through 11. Segments 1 (Antelope-Pardee) and Segments 2 and 3 (Antelope Transmission Project) were evaluated in separate CEQA and NEPA documents as described below.
- **Devers–Palo Verde 500 kV Transmission Line Project EIS/EIR, southern California/western Arizona.** For this EIR/EIS prepared by U.S. Bureau of Land Management and CPUC, Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for SCE's proposed 250-mile transmission line project from the Palo Verde Nuclear power plant in Arizona to the northern Palm Springs area in California. Major issues of concern include EMF and visual impacts on property values, impacts on the area's vast recreational resources and tribal lands, and the development and evaluation of several route alternatives, including the Devers-Valley No. 2 Route Alternative, which eventually was approved by the CPUC.
- **Antelope-Pardee 500 kV Transmission Line Project EIS/EIR, Los Angeles County, CA.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for SCE's proposed 25-mile transmission line project from the Antelope Substation in the City of Lancaster, through the ANF, and terminating at SCE's Pardee Substation in Santa Clarita. Major issues of concern included impacts to biological, recreational, and cultural resources within Forest lands, EMF and visual impacts on property values, impacts on residences in the urbanized southern regions of the route, and the development and evaluation of several route alternatives.
- **MARS EIR/EIS, Monterey, CA.** Mr. Debauche served as the technical specialist in charge of preparing the Environmental Justice analysis for this EIR/EIS, which would evaluate the effects associated with the

installation and operation of the proposed Monterey Accelerated Research System (MARS) Cabled Observatory Project (Project) proposed by Monterey Bay Aquarium Research Institute (MBARI)[NEPA Lead Agency]. The goal of the Project was to install and operate, in State and Federal waters, an advanced cabled observatory in Monterey Bay that would provide a continuous monitoring presence in the Monterey Bay National Marine Sanctuary (MBNMS) as well as serve as the test bed for a state-of-the-art regional ocean observatory, currently one component of the National Science Foundation (NSF) Ocean Observatories Initiative (OOI). The Project would provide real-time communication and continuous power to suites of scientific instruments enabling monitoring of biologically sensitive benthic sites and allowing scientific experiments to be performed. The environmental justice analysis evaluated the potential for any disproportionate project impacts to both land-based populations and fisheries workers. The CEQA Lead Agency was CSLC.

- **El Casco System Project EIR, Riverside, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for this EIR prepared for the CPUC to evaluate SCE's application for a Permit to Construct (PTC) the El Casco System Project. The Proposed Project would be located in a rapidly growing area of northern Riverside County, which includes the Cities of Beaumont, Banning, and Calimesa. A 115 kV subtransmission line begins at Banning Substation and extends westward toward the proposed El Casco Substation site within the existing Banning to Maraschino 115 kV subtransmission line and Maraschino–El Casco 115 kV subtransmission line ROWs. Major issues of concern include impacts to existing and residential land uses, which have led to the development of a partial underground alternative and a route alternative different than the project route proposed by SCE (the Applicant). The 1,200-page Draft EIR was released for a 45-day public review and comment on December 12, 2007, and evaluates project alternatives at the same level of detail as the Proposed Project analysis.
- **Antelope Transmission Project, Segments 2 & 3 EIR, Los Angeles and Kern Counties, CA.** For this EIR being prepared by the CPUC, Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation. The proposed Project includes both Segment 2 and Segment 3 of the Antelope Transmission Project, and involves construction of new transmission line infrastructure from the Tehachapi Wind Resource Area in southern Kern County, California, to SCE's existing Vincent Substation in Los Angeles County, California. The Tehachapi Wind Resource Area is one of the State's greatest potential sources for the generation of wind energy. A variety of wind energy projects are currently in development for this region. Major issues of concern include EMF and visual impacts on property values, impacts on residences and agricultural resources, and the development and evaluation of several substation and route alternatives.
- **Diablo Canyon Power Plant (DCPP) Steam Generator Replacement Project EIR, San Luis Obispo County, CA.** Mr. Debauche served as the Technical Specialist for Socioeconomics and Alternatives evaluation of this EIR. The EIR addressed impacts associated with the replacement of the eight original steam generators (OSGs) at DCPP Units 1 and 2 due to degradation from stress and corrosion cracking, and other maintenance difficulties. The Proposed Project would be located at the DCPP facility, which occupies 760 acres within PG&E's 12,000-acre owner-controlled land on the California coast in central San Luis Obispo County.
- **SDG&E Miguel Mission Substation Draft EIR.** The major part of the Proposed Project would include the installation of a new, bundled 230 kV circuit between Miguel and Mission Substations, which would be located entirely within SDG&E's existing 35-mile ROW. Mr. Debauche prepared social science analysis for the Initial Study, as well as the Draft EIR Project Description and several key environmental sections.
- **PG&E's Proposed Divestiture of Hydroelectric Assets Project EIR.** Mr. Debauche prepared several key sections of the Draft EIR, including Socioeconomics and Hazardous Materials analysis.
- **Viejo System Project IS/MND, Orange County, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for the project's CEQA documentation, including and Initial Study, prepared on behalf of the CPUC to evaluate Southern California Edison's (SCE) Application for a Permit to Construct the Viejo System Project, which was in SCE's forecasted demand of electricity and goal of providing reliable electric service in southern Orange County. The Viejo System Project would serve Lake Forest, Mission Viejo, and the surrounding areas. Components of the project included, construction of the new 220/66/12 kilovolt (kV) Viejo Substation, installation of a new 66 kV subtransmission line within an existing SCE right-of-way, replacement of 19

double-circuit tubular steel poles with 13 H-frames structures, and minor modification to other transmission lines. Major issues of concern include visual impacts of transmission towers, EMF effects, and project impacts on property values.

- **Looking Glass Networks Fiber Optic Cable Project IS/MND, northern and southern California.** As part of Aspen's ongoing contract with the CPUC for review of Telecommunications projects, this document encompasses and evaluation of project impacts and network upgrades in the San Francisco Bay Area and the Los Angeles Basin Area. Prepared the socioeconomic analysis for this comprehensive CEQA document reviewing the potential impacts of hundreds of miles of newly proposed fiber optic lines throughout northern and southern California, including Los Angeles and Orange Counties.

California Energy Commission (CEC), Technical Assistance in Application for Certification Review. In response to California's power shortage, Aspen is assisting the California Energy Commission in evaluating the environmental and engineering aspects of new power plant applications throughout the State. As part of this effort, Mr. Debauche works as a technical specialist for Transportation/Traffic, Socioeconomics and Environmental Justice, and Alternatives analyses for the following power plant projects:

- **Carlsbad Energy Center Project, Carlsbad, CA.** Technical Specialist for both the Transportation/Traffic and Alternatives Staff Assessment for Carlsbad Energy Center, LLC's Application for Certification (AFC) to build the Carlsbad Energy Center Project (CECP), which will consist of a 558 MW gross combined-cycle generating facility configured using two units with one natural-gas-fired combustion turbine and one steam turbine per or unit. Issues of concern include major incompatibilities with local LORS, and cumulative impacts from widening of I-5.
- **GWF Tracy Combined Cycle Power Plant, San Joaquin County, CA.** Technical Specialist for the Transportation/Traffic Staff Assessment for GWF's proposal to modify the existing TPP, a nominal 169-megawatt (MW) simple-cycle power plant, by converting the facility into a combined-cycle power plant with a nominal 145 MW, net, of additional generating capacity.
- **GWF Henrietta Peaker Project, Kings County, CA.** Technical Specialist for the Transportation/Traffic Staff Assessment for GWF's proposal to modify the existing Henrietta Power Plant. New once-through steam generators (OTSGs) will be installed to allow the plant to be operated in its current simple-cycle configuration with no steam generation but with the selective catalytic reduction (SCR) and oxidation catalyst in operation, or to operate as a combined-cycle power plant generating an additional 25 MW of power with new proposed emission limits.
- **CPV Vaca Station Power Plant, Solano County, CA.** Technical Specialist for the Transportation/Traffic Staff Assessment for CPV Vacaville, LLC (CPVV) filed an Application for Certification (08-AFC-11) seeking authority to construct and operate the CPV Vaca Station (CPVV) project, a natural gas-fired, combined-cycle electrical generating facility rated at a nominal generating capacity of 660 megawatts (MW). The CPVV is proposed for a 24-acre site located at the intersection of Lewis and Fry roads in a rural area within the city limits of Vacaville, Solano County.
- **Kings River Conservation District Community Peaker Power Plant, Fresno County, CA.** Technical Specialist for the Transportation/Traffic Staff Assessment for the Kings Rivers Conservation District, who filed a Small Power Plant Exemption for the King River Conservation District Peaking Power Plant. The proposed 97-megawatt natural gas-fired plant will be located south of the City of Fresno and near the community of Malaga in Fresno County.
- **Lodi Energy Center, Lodi, CA.** Technical Specialist for the Socioeconomics Staff Assessment for a combined-cycle nominal 225-megawatt (MW) power generating facility.
- **Ivanpah Solar Electric Generating System Project, San Bernardino County, CA.** Technical Specialist for the Socioeconomics Staff Assessment/BLM EIS for a 400-megawatt solar thermal electric power generating system. The project's technology would include heliostat mirror fields focusing solar energy on power tower receivers producing steam for running turbine generators. Related facilities would include administrative buildings, transmission lines, a substation, gas lines, water lines, steam lines, and well water pumps. The proposed project would be developed entirely in the Mojave Desert region of San Bernardino County, California.

- **Canyon Power Plant, Anaheim, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a nominal 200 megawatt (MW) simple-cycle plant, using four natural gas-fired combustion turbines and associated infrastructure proposed by Southern California Public Power Authority (SCPPA). This project is a peaking power plant project located within the City of Anaheim, California.
- **Valero Cogeneration Project, Benicia, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a proposed cogeneration facility at the Valero Refinery in Benicia. Issues addressed included impacts on public services and other project-related population impacts such as school impact fees.
- **Rio Linda/Elverta Power Project, Sacramento, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a 560-megawatt natural gas power plant in the northern Sacramento County. Issues of importance included environmental justice and impacts on property values.
- **Magnolia Power Project, Burbank, CA.** Technical Specialist for the Socioeconomics Staff Assessments for this nominal 250-megawatt natural gas combined-cycle fired electrical generating facility to be located at the site of the existing City of Burbank power plant. Environmental justice issues and potential impacts on local economy and employment were evaluated.
- **Avenal Energy Project, Kings County, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a 600-megawatt combined cycle electrical generating facility, and associated linear facilities.
- **Inland Empire Energy Center, Riverside County, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a 670-megawatt natural gas-fired, combined-cycle electric generating facility and associated linear facilities including, a new 18-inch, 4.7-mile pipeline for the disposal of non-reclaimable wastewater, and a new 20-inch natural gas pipeline. The project would be located on approximately 46-acres near Romoland, within Riverside County.
- **Coastal Plant Study.** Technical Specialist for the Socioeconomics Staff Assessments for a possible modernization, re-tooling, or expansion of California's 25 coastal power plants including the Encina Power Plant and the San Onofre Nuclear Power Plant.

Los Angeles Department of Water and Power (LADWP). Responsible for conducting the analyses of the technical and social science issue areas for a variety of EISs and EAs as part of two environmental services contracts. Delivery orders have included:

- **River Supply Conduit (RSC) Upper Reach Project EIR, Los Angeles and Burbank, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for the CEQA document for this project. The RSC is a major transmission pipeline in the LADWP water distribution system. The existing RSC pipeline's purpose is to transport large amounts of water from the Los Angeles Reservoir Complex and local ground water wells to reservoirs and distribution facilities located in the central areas within of the City of Los Angeles. The LADWP proposed a new larger RSC pipeline to replace and realign the Upper and Lower Reaches of the existing RSC pipeline, which would involve the construction of approximately 69,600 linear feet (about 13.2 miles) of 42-, 48-, 60-, 66-, 72-, 84-, and 96-inch diameter welded steel underground pipeline.
- **Mulholland Pumping Station and Lower Hollywood Reservoir Outlet Chlorination Station Project IS/MND, Los Angeles, CA.** Under Aspen's on-going environmental services contract with the City of Los Angeles Department of Water and Power (LADWP), Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for preparation of CEQA documentation for this project. LADWP proposed to replace the existing historic pumping/chlorination station building as well as the existing lavatory and unoccupied Water Quality Laboratory buildings with a new single structure pumping/chlorination station within the LADWP's Hollywood Reservoir Complex located in the Hollywood Hills section of the City Los Angeles. These improvements were required due to the age and deterioration of the facility and the potential risk of seismic damage to existing structures. An Initial Study was prepared in support of a City of Los Angeles General Exemption.
- **Taylor Yard Water Recycling Project (TYWRP) IS/MND, Los Angeles and Glendale, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for preparation of CEQA documentation for this project. LADWP proposed to construct the TYWRP in order to provide recycled water produced by the Los Angeles–Glendale Water Reclamation Plant (LAGWRP) to the Taylor Yard. An important part of the City of Los Angeles' expanding emphasis on water conservation is the concept that water is a resource that can be used more

than once. Because all uses of water do not require the same quality of supply, the City has been developing programs to use recycled water for suitable landscaping and industrial uses. The project is located in the southernmost part of the City of Glendale and northeastern part of the City of Los Angeles. The IS/MND was adopted in the Summer of 2007.

- **DC Electrode Project IS/MND, Los Angeles, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for preparation of CEQA documentation for this project. LADWP proposed to construct a new electrode distribution line from West Los Angeles to the Pacific Ocean stopping point in Malibu, CA up the Pacific Coast Highway.
- **District Cooling Plant Project, Los Angeles IS/MND, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for preparation of CEQA documentation for this project. LADWP proposed to construct a District Cooling Plant and Distribution System (proposed project) in order to provide a centralized system for producing chilled water for use by area users, which are generally large commercial, governmental, industrial and institutional buildings who generate their own chilled water utilizing individual chiller plants for space cooling and air-conditioning.

U.S. Army Corps of Engineers, Los Angeles District. Responsible for conducting the analyses of the social science issue areas for a variety of EISs and EAs as part of two environmental services contracts. Delivery orders have included:

- **Northeast Phoenix Drainage Area Alternatives Analysis Report, Phoenix and Scottsdale, AZ.** Worked with preparation of an alternatives analysis report that evaluated the potential environmental impacts associated with channel and detention basin alternatives to control flooding problems resulting from fast rate of development in the northeast Phoenix area.
- **Murrieta Creek Flood Control and Environmental Restoration Project**. Mr. Debauche served as a technical writer of an Environmental Assessment and Mitigation Monitoring plan for Phase 1 of a flood control and restoration project in Riverside County.

California Department of Water Resources. Responsible for conducting the environmental analyses for CEQA compliance as part of two environmental services contracts. Delivery orders have included:

- **Piru Creek Stabilization and Restoration Project.** The California Department of Water Resources (CDWR) proposes to repair erosion damage at a series of three locations downstream of Pyramid Dam and seismically retrofit the Pyramid Dam access bridge that crosses Piru Creek. Mr Debauche served as technical writer of the Initial Study for this project.

Los Angeles Unified School District (LAUSD), Los Angeles County, CA. Deputy Program manager and Technical writer for several CEQA documents (EIRs and IS/MNDs) being prepared as part of Aspen's ongoing services contract with the LAUSD to help approve school projects that would meet existing overcrowded conditions in the greater Los Angeles area. Projects have included:

- **New School Construction Program EIR.** Serves as a technical writer for social science issues, including socioeconomics, and population and housing for this Program EIR being prepared for the LAUSD. The LAUSD 2020 Program would provide student seats throughout the LAUSD via a combination of the addition of portable classrooms to existing campuses, modernization and reconfiguration of existing campuses, and the construction of new schools. Mr. Debauche prepared the Noise, Socioeconomic, and Alternative Evaluation of this EIR.
- **East Valley Middle School No. 2 EIR.** Served as a key technical writer for this middle school project proposed to be located at the previous Van Nuys Drive-In site. The EIR focused on impacts associated with air quality, hazards and hazardous materials, noise, land use and planning, and traffic and transportation. Major issues of concern included traffic and noise generated by school operation activities. The EIR included LAUSD design standards and measures employed to minimize environmental impacts.
- **Mt. Washington Elementary School Multi-Purpose Room Addition Project IS/MND.** Served as Deputy Program Manager for this project proposed the development of a multi-purpose room facility, including a library, auditorium, and theater, to the existing Mt. Washington Elementary School campus located in Los Angeles. The surrounding residential community had concerns regarding the proposed

project's impacts on aesthetics, traffic, air quality, and noise. Of particular concern, was impacts generated due to the after-hours use of the multi-purpose room facility by civic and community groups.

- **Canoga Park New Elementary School IS/MND.** Served as technical writer for this elementary school project proposed to be developed on a parcel of land owned by the non-profit organization, New Economics For Women (NEW). This "turn-key" project consisted of a Charter Elementary School to be developed by NEW and sold to the LAUSD for operation. It was later decided that NEW would lease the school back and run it as a charter school. Issues of concern included, pedestrian safety, traffic, air quality, noise, and land use.
- **Hughes Magnet Span School IS/MND.** Served as a technical writer for socioeconomics, hydrology, public services and utilities, and recreational impacts for the proposed re-opening of the existing Hughes Middle School as a Magnet Span School serving up to 1,620 District 6th though 12th grade students. The re-opening of the Hughes Middle School would require the relocation of the existing uses of the campus. The existing Enadia Way Elementary School and Platt Ranch Elementary School would be re-opened for the relocation of these uses.
- **Wonderland Elementary School Portable Classroom Additions IS/MND.** Served as the technical writer of an IS/MND for a proposed addition to the Wonderland Avenue Elementary School, located in the City of Los Angeles. Ms. Walker is responsible for overall coordination and scheduling of the project's environmental review, communications with the LAUSD, senior technical review of all documents produced, presentation during the project's public scoping meetings and hearings, and assurance of public noticing. Served as technical writer of the IS/MND.
- **Pio Pico Elementary School Playground Expansion IS/MND**. Completed a Notice of Preparation, Initial Study, and Administrative Draft EIR for the expansion of a playground at the existing Pio Pico School in the LAUSD. The playground was proposed on five residential properties. One of the residences is a potentially significant historical resource because of its association with an African-American woman journalist, Fay M. Jackson. This project was cancelled by the LAUSD after completion of the administrative draft report. Served as technical writer of the IS/MND.
- **Fairfax Senior High School Portable Classroom Addition IS/MND**. Served as technical writer of the IS/MND for the addition of portable classrooms at the school. Major issue areas covered were noise, hydrology, and geotechnical analysis.
- **Polytechnic Senior High School Portable Classroom Addition IS/MND**. Served as technical writer of the IS/MND for the addition of portable classrooms at the school. Major issue areas covered were noise, hydrology, and geotechnical analysis.
- **Washington Senior High School Portable Classroom Addition IS/MND**. Served as technical writer of the IS/MND for the addition of portable classrooms at the school. Major issue areas covered were noise, hydrology, and geotechnical analysis.

EIP Associates 1998 to 2001

MTA Mid Cities/Westside Transit Corridor Study EIS/EIR. Was a key writer of the EIS/EIR for this 3-phase (including prepared the Major Investment Study (MIS), the Environmental Impact Statement (EIS), and an evaluation of the urban design implications of transit interventions on selected routes) study intended to address current and long range traffic congestion in the central and westside areas of the Los Angeles Basin. Three east/west corridors and a range of transit alternatives ranging including Rapid Bus, light rail, and heavy rail are being evaluated. In addition to preparing several issue area chapters of this comprehensive joint EIS/EIR, Mr. Debauche assisted with the Environmental Justice Analysis (per Executive Order 12898), the Section 4(f) Parklands discussion, and the land use and socioeconomics sections of the EIS/EIR.

Wes Thompson Ranch Development Project EIR. Served as project writer for this hillside residential development in the City of Santa Clarita. Issues of concern included seismic and air quality impacts associated with the excavation of 2 million cubic yards of soil, the project's non-compliance with the City's hillside ordinance for innovative design, and traffic generated by project-related population growth in the area. Four different site configuration alternatives were developed as part of the EIR analysis. Other

issues of concern included sensitive biological resources, the potential for hydrological impacts due to disturbance of the hillside, and cultural resources. As the technical writer for socioeconomics, noise, hazardous materials, air quality, and public services, Mr. Debauche conducted analysis and prepared these environmental sections as well as the project description, alternatives screening and development, traffic assistance, and cumulative scenario for:

City of Santa Monica Environmental Assessments. Was key writer of several environmental assessment documents for housing, commercial, institutional, and mixed-use developments in compliance with CEQA. As the technical writer for socioeconomics, noise, hazardous materials, air quality, and public services, Mr. Debauche conducted analysis and prepared these environmental sections as well as the project description, alternatives screening and development, traffic assistance, and cumulative scenario for:

- **Seaview Court Condominiums IS/MND.** This comprehensive Initial Study/Mitigated Negative Declaration included six technical reports including traffic, cultural resources, parking survey, shade and shadow analysis, and a geotechnical assessment to evaluate the level of severity of this development in the waterfront area of Santa Monica. Major issues of concern were; parking and project-generated traffic on adjacent narrow residential streets; visual obstruction and shading impacts of the proposed structure; liquefaction and seismic impacts to adjacent properties as result of the projsect's excavation for a subterranean parking garage; and the potential impacts of the project to impact the integrity of a historic district and the historic Seaview Walkway to the beachfront.
- **Four-Story Hotel IS/MND.** A comprehensive Initial Study/Mitigated Negative Declaration was prepared for this four-story hotel adjacent to St. John's Hospital in Santa Monica. Major issues of concern included project-generated traffic on surrounding multi-family residential uses and emergency access to the hospital.
- **Santa Monica College Parking Structure B Replacement EIR.** This focused EIR addressed issues related to traffic and neighborhood land use impacts associated with the addition of a 3-story parking structure in the center of the SMC campus. Major issues of concern included the potential for project-generated traffic to cause congestion at the school's main entrance on Pico Boulevard, and the potential for overflow traffic to impact the Sunset Community of single-family homes adjacent to the school.
- **North Main St. Mixed-Use Development Project EIR**. This EIR included evaluation of impacts resulting from the development of a mixed-use development in Santa Monica's "Commercial Corridor" on Main Street, with ground-floor residences and boutique commercial uses. Major issues of concern included traffic and parking impacts to Main Street and surrounding residential land uses, shade and shadow impacts, and neighborhood impacts.

Specific Plans and Redevelopment Projects. As the technical writer for socioeconomics, noise, hazardous materials, air quality, and public services, Mr. Debauche conducted analysis and prepared these environmental sections as well as the project description, alternatives screening and development, traffic assistance, and cumulative scenario for:

- **Cabrillo Plaza Specific Plan EIR in Santa Barbara.** This project consisted a mixed-use commercial development on Santa Barbara's waterfront on Cabrillo Boulevard. On-site uses included an aquarium, specialty retail, restaurants, and office space.
- **Culver City Redevelopment Plan and Merger EIR.** This programmatic EIR evaluated the impacts of the City's redevelopment of its redevelopment zones. A major land use survey and calculation of acreage of redevelopment lands was conducted as part of the EIR.
- **Dana Point Headlands Specific Plan EIR.** This EIR evaluated the development of coastal bluff in the City with hotel, single- and multi-family residential, and commercial uses. Major issues of concern included ground disturbance as a result of excavation, impacts to terrestrial and wildlife biology, recreation impacts to beachgoers, and project-generate population inducement.
- **Triangle Gateway Redevelopment Project EIR in Beverly Hills, CA.** This EIR evaluated the development of a supermarket, retail shops, and office space in the triangle gateway portion of

downtown Beverly Hills. Issues of concern evaluated by Mr. Debauche included traffic, land use, and impacts to on-site historic structures.

- **UCLA Campus Housing Expansion.** This EIR evaluated the development and expansion of campus housing within the UCLA campus. Issues of concern evaluated by Mr. Debauche included hazardous materials and population/housing.

CH2M Hill - Minneapolis, MN 1995 to 1998

- **Minneapolis/St. Paul International Airport Expansion EIS:** Mr. Debauche was a key writer of the EIS for this $4 million technical and environmental study, including the preparation of an Environmental Impact Statement (EIS), and an evaluation of the urban design implications of a proposed $800 million expansion of the existing MSP International airport, including transit and terminal modifications and the inclusion of a new perpendicular runaway. The studies included alternatives to the project and the long-term effects on the cities of Minneapolis and St. Paul. In addition to preparing several issue area chapters of this comprehensive EIS, Mr. Debauche assisted with the Environmental Justice Analysis (per Executive Order 12898), the Section 4(f) Parklands discussion, and the socioeconomics sections of the EIS. In addition, Mr. Debauche assisted with preparation of a technical report on airport noise effects on nearby housing and mitigation programs for the impacts of the proposed runway.
- **Minneapolis/St. Paul Wastewater Treatment Facility Expansion EIS:** Was a key writer of the EIS for expansion of the existing wastewater treatment facility serving the twin cities area. The studies included alternatives to the project and the long-term effects on the cities of Minneapolis and St. Paul. Mr. Debauche prepared several issue area chapters of this comprehensive EIS, including the Environmental Justice Analysis (per Executive Order 12898), and the socioeconomics sections of the EIS.

PROFESSIONAL ASSOCIATIONS

- American Planning Association (APA), Chapter Member

DECLARATION OF
Testimony of William Walters, P.E.

I**, William Walters,** declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as a senior associate in engineering and physical sciences.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Traffic and Transportation (Plume Velocity Analysis)** and **Visual Resources (Visible Plume Modeling Analysis)**, for the **GWF Tracy Combined Cycle Power Plant** project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: July 29, 2009 Signed: Original signature in Docets

At: Agoura Hills, California

WILLIAM WALTERS, P.E.
Air Quality Specialist

ACADEMIC BACKGROUND
B.S., Chemical Engineering, 1985, Cornell University

PROFESSIONAL EXPERIENCE

Mr. Walters has over 20 years of technical and project management experience in environmental compliance work, including environmental impact reports, RCRA/CERCLA site assessment and closure, site inspection, source monitoring, emissions inventories, source permitting, and energy and pollution control research.

Aspen Environmental Group — 2000 to present

Responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- **Engineering and Environmental Technical Assistance to Conduct Application for Certification Review for the California Energy Commission:**
  - Preparation and project management of the air quality section of the Staff Assessment and/or Initial Study and the visual plume assessment for the following California Energy Commission (CEC) licensing projects: Hanford Energy Park; United Golden Gate, Phase I; Huntington Beach Modernization Project (including Expert Witness Testimony); Woodland Generating Station 2; Ocotillo Energy Project, Phase I; Magnolia Power Project; Colusa Power Project; Inland Empire Energy Center; Rio Linda/Elverta Power Plant Project; Roseville Energy Center; Henrietta Peaker Project; Tracy Peaking Power Plant Project (including Expert Witness Testimony); Avenal Energy Project; San Joaquin Valley Energy Center (including expert witness testimony); Salton Sea Unit 6 Project (including expert witness testimony); Modesto Irrigation District Electric Generation Station (including expert witness testimony); Walnut Energy Center (including expert witness testimony); Riverside Energy Resource Center (including expert witness testimony); Pastoria Energy Facility Expansion; Panoche Energy Center (in progress); Starwood Power Plant (in progress); Bullard Energy Center (in progress).
  - Preparation and project management of the visual plume assessment for the following California Energy Commission (Energy Commission) licensing projects: Metcalf Energy Center Power Project (including Expert Witness Testimony); Contra Costa Power Plant Project (including Expert Witness Testimony); Mountainview Power Project; Potrero Power Plant Project; El Segundo Modernization Project; Morro Bay Power Plant Project; Valero Cogeneration Project; East Altamont Energy Center (including expert witness testimony); Russell City Energy Center; SMUD Cosumnes Power Plant Project (including expert witness testimony); Pico Power Project; Blythe Energy Project Phase II; City of Vernon Malburg Generating Station; San Francisco Electric Reliability Project; Los Esteros Critical Energy Facility Phase II; Roseville Energy Park; City of Vernon Power Plant (in progress); South Bay Replacement Project; Walnut Creek Energy Park; Sun Valley Energy Project; Highgrove Power Plant (in progress); Colusa Generating Station; and Russell City Energy Center (in progress).
  - Assistance in the aircraft safety review of thermal plume turbulence for the Riverside Energy Resources Center; Russell City Energy Center Amendment (in progress); Eastshore Energy Power Plant; and the Blythe Energy Power Plant and Blythe Energy Project Phase II (including expert witness testimony) siting cases. Assistance in the aircraft safety review of thermal and visual plumes of the operating Blythe Energy Power Plant.

- Preparation of a white paper on methods for the determination of vertical plume velocity determination for aircraft safety analyses.
- Preparation and instruction of a visual water vapor plume modeling methodology class for the CEC.
- Preparation and project management of the public health section of the Initial Study for the Woodland Generating Station 2 Energy Commission licensing project.
- Preparation of project amendment or project compliance assessments, for air quality or visual plume impacts, for several licensed power plants, including: Metcalf Energy Center; Pastoria Power Plant; Elk Hills Power Plant; Henrietta Peaker Project; Tracy Peaker Project; Magnolia Power Project; Delta Energy Center; SMUD Cosumnes Power Plant; Walnut Energy Center; San Joaquin Valley Energy Center; City of Vernon Malburg Generating Station; Otay Mesa Power Plant; Los Esteros Critical Energy Facility; Pico Power Project; Riverside Energy Resource Center; Blythe Energy Project Phase II; Inland Empire Energy Center; and Salton Sea Unit 6 Project.
- Preparation of the air quality section of the staff paper "A Preliminary Environmental Profile of California's Imported Electricity" for the Energy Commission and presentation of the findings before the Commission.
- Preparation of the staff paper "Emission Offsets Availability Issues" and preparation and presentation of the Emission Offsets Constraints Workshop Summary paper for the Energy Commission.
- Completion of an audit of power plant cost factors for integration into the Energy Commission Cost of Generation Model.

- For the **Los Angeles Department of Water and Power (LADWP)**:
  - Preparation of the Air Quality Inventory for the LADWP River Supply Pipeline Project EIR.
  - Project management and preparation of the Air Quality Section for the LADWP Valley Generating Station Stack Removal IS/MND support project.
- For the **Department of Water Resources (DWR)**:
  - Preparation of the Air Quality sections for two separate DWR Santa Ana Valley Pipeline Repairs Project CEQA Categorical Exemption Memorandums.
  - Preparation of the emission estimates used in the Air Quality Sections for the DWR Tehachapi Second Afterbay Project Initial Study and EIR.
- For the **U.S. Army Corps of Engineers (Corps)**:
  - Preparation of the Air Quality Section and General Conformity Analysis for the Matilija Dam Ecosystem Restoration Project EIS/R for the Corps.
  - Preparation of emission inventory and General Conformity Analysis of the Murrieta Creek Flood Control Project and the Joint Red Flag exercise to be conducted in the Nevada Test and Training Range.
  - Emission inventory for the construction activities forecast for the San Jose/Old San Jose Creeks Ecosystem Restoration project for the Corps.
- For **Los Angeles Unified School District (LAUSD)**:
  - Preparation of the Air Quality Section of the LAUSD New School Construction Program EIR and provided traffic trip and VMT calculation support for the Traffic and Transportation Section.
  - Management and preparation of the Draft Air Quality Sections for the Reseda Senior High School Portable Addition IS/MND and Wonderland Elementary Addition IS/MND projects for LAUSD.
- Other Projects:
  - Preparation of the draft staff paper "Natural Gas Quality: Power Turbine Performance During Heat Content Surge", and presentation of the preliminary findings at the California Air Resources Board Compressed Natural Gas Workshop and a SoCalGas Technical Advisory Committee meeting.

- Preparation of the Air Quality section of the PG&E Hydrodivestiture Draft EIR/EIS for the California Public Utilities Commission (CPUC).
- Preparation of the Air Quality Section of the Environmental Information Document in support of the Coastal Consistency Determinations for the suspension of operation requests for undeveloped units and leases off the Central California Coast.
- Preparation of comments on the Air Quality, Alternatives, Marine Traffic, Public Safety, and Noise section of the Cabrillo Port Liquefied Natural Gas Deepwater Port Draft EIS/EIR for the City of Oxnard.

Camp Dresser & McKee, Inc. 1998 to 2000

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Preparation of emission inventories and dispersion modeling for criteria and air toxic pollutants for the Los Angeles International Airport Master Plan (LAXMP) EIS/EIR.
- Project Manager/Technical lead for the completion of air permit applications and air compliance audits for two Desa International fireplace accessory manufacturing facilities located in Santa Ana, California.
- Project manager/technical lead for the completion of Risk Management Plans (RMPs) for four J.R. Simplot food processing facilities in Oregon, Idaho, and Washington and the Consolidated Reprographics facility located in Irvine, California.

Planning Consultants Research 1997 to 1998

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Project Manager for a stationary source emission audit of the entire Los Angeles International Airport complex for Los Angeles World Airports (LAWA) in support of the LAXMP.
- Review of the Emission Dispersion Modeling System (EDMS) and preparation of a report with findings to the Federal Aviation Administration for LAWA in support of the LAXMP.
- Project manager for the ambient air monitoring and deposition monitoring studies performed for LAWA in support of the LAXMP, including the selection of the monitoring sites and specialty subcontractor, and review of all monitoring data.

Aspen Environmental Group/Clean Air Solutions 1995 to 1996

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Manager of the Portland, Oregon, office of Clean Air Solutions from March 1995 to December 1995, with responsibilities including Project Management, Business Development, and Administration.
- Control technology assessment, engineering support and Notice of Intent to construct preparation for J.R. Simplot's Hermiston, Oregon, food processing facility. Review and revision of an Air Contaminant Discharge Permit application, Title V permit application, and PSD modeling analysis for J.R. Simplot's Hermiston facility.

- Air quality compliance report including an air emission inventory, regulation and permit compliance determination, and recommendations for compliance for Lumber Tech, Inc.'s Lebanon, Oregon, wood products facility.

Fluor Daniel, Inc. **1990 to 1995 and 1996 to 1997**

Mr. Walters was responsible as lead technical or project manager for major environmental projects for both government and private clients. His projects included:

- Prepared several air permit applications for the ARCO Los Angeles Refinery Polypropylene Plant Project; Phase I environmental assessments for properties located in Southern California; and a site investigation and RCRA closure plan for a hazardous waste storage site in Vernon, California.
- Project manager of the Anaconda Smelter site for the U.S. Environmental Protection Agency's (EPA) Alternative Remedial Contract System (ARCS) project during the conclusion of technical activities and project closeout. Prepared a cost recovery report for the project.
- Performed environmental analysis for the Bonneville Power Authority, including air pollution BACT analysis, wastewater analysis, and evaluation of secondary environmental effects of electric power producing technologies.

Jacobs Engineering Group **1988 to 1990**

Mr. Walters was responsible for a wide range of air pollution regulatory and testing projects, including the following:

- Project manager of air toxic emission inventory reports prepared for U.S. Borax's boron mining and refining facility and the Naval Aviation Depot (N. Island Naval Base, San Diego, California).
- Prepared air permit applications and regulatory correspondence for several facilities including the U.S. Department of Energy's Feed Material Production Center uranium processing facility in Fernald, Ohio; Evaluation of a sludge dewatering process at Unocal's Wilmington, California, Refinery; and United Airlines blade repair facility at the San Francisco Airport.
- Characterized and quantified air emissions for offshore oil and gas development activities associated with Federal oil and gas Lease Sale 95, offshore southern California, for the U.S. Minerals Management Service.

CERTIFICATIONS

- Chemical Engineer, California License 5973
- CARB, Fundamentals of Enforcement Seminar
- EPA Methods 1-8, 17; Training Seminar

AWARDS

- California Energy Commission Outstanding Performance Award 2001

DECLARATION OF

Dr.Obed Odoemelam

I, **Obed Odoemelam** declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting, Transmission, and Environmental Protection Division as a Staff Toxicologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transmission Line safety and Nuisance** for GW Tracy Combined Cycle Power Plant based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: 7/29/09 Signed: Original signature in Dockets

At: Sacramento, California

RESUME

DR. OBED ODOEMELAM

EDUCATION:

1979-1981 University of California, Davis, California. Ph.D., Ecotoxicology

1976-1978 University of Wisconsin, Eau Claire, Wisconsin. M.S., Biology.

1972-1976 University of Wisconsin, Eau Claire, Wisconsin. B.S., Biology

EXPERIENCE:

1989
The Present: California Energy Commission. Staff Toxicologist.

Responsible for the technical oversight of staffs from all Divisions in the Commission as well as outside consultants or University researchers who manage or conduct multi-disciplinary research in support of Commission programs. Research is in the following program areas: Energy conservation-related indoor pollution, power plant-related outdoor pollution, power plant-related waste management, alternative fuels-related health effects, waste water treatment, and the health effects of electromagnetic fields. Serve as scientific adviser to Commissioners and Commission staff on issues related to energy conservation. Serve on statewide advisory panels on issues related to multiple chemical sensitivity, ventilation standards, electromagnetic field regulation, health risk assessment, and outdoor pollution control technology. Testify as an expert witness at Commission hearings and before the California legislature on health issues related to energy development and conservation. Review research proposals and findings for policy implications, interact with federal and state agencies and industry on the establishment of exposure limits for environmental pollutants, and prepare reports for publication.

1985-1989 California Energy Commission.

Responsible for assessing the potential impacts of criteria and noncriteria pollutants and hazardous wastes associated with the construction, operation and decommissioning of specific power plant projects. Testified before the Commission in the power plant certification process, and interacted with federal and state agencies on the establishment of environmental limits for air and water pollutants.

1983-1985 California Department of Food and Agriculture.

Environmental Health Specialist.

Evaluated pesticide registration data regarding the health and environmental effects of agricultural chemicals. Prepared reports for public information in connection with the eradication of specific agricultural pests in California.

DECLARATION OF
Marie McLean

I**,** Marie McLean, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Siting, Transmission, and Environmental Protection Division as an Environmental Planner ll.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on Visual Resources for the Final Staff Assessment for the GWF Tracy Combined-Cycle Power Plant Project (08-AFC-7) based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: August 25, 2009 Signed: Original signature in Dockets

At: Sacramento, California

MARIE McLEAN

QUALIFICATIONS SUMMARY

Twenty years experience in the field of environmental research, analysis, and planning, with specific emphasis on the economics of water, energy, and land use and its social, visual, and cultural ramifications. Specific projects involved (1) assessing economic costs and benefits of water delivery contracts and energy sales; (2) conducting and presenting visual analyses of historic and other local, state, and federal resources; (3) preparing local, state, and federal resource assessment forms; (4) determining and communicating benefits and costs of proposed development projects (housing, energy, and water) on the social and economic life of communities in which they are located; and (5) as member of local design review, historic preservation, and housing boards, recommended programs and policies and monitored their implementation.

RECENT PROFESSIONAL EXPERIENCE

California Energy Commission, Planner II, Environmental Office-Facilities Siting, January 2008—present.

Conduct technical analyses for complex facility siting cases and planning studies in the area of socioeconomics and visual resources.

Electricity Oversight Board; June 1, 2007—December 31, 2008.

Developed, conducted, and presented economic studies on energy markets and transmission projects; California Independent System Operator (CAISO) market redesign and technology upgrade program; and investigated, analyzed, and reported the effects of existing and proposed energy programs on supply, demand, and rates.

California Department of Water Resources, State Water Project Analysis Office, June 2001—July 31, 2007.

Developed and implemented complex analyses of the social, economic, and financial ramifications of contracted and proposed water deliveries and transfers and changes to valuation methods for selling energy in deregulated markets. Researched, identified, and reported on market activities in energy and water and their economic effects on ratepayers.

EDUCATION

Bachelor of Arts, Economics, California State University, Sacramento, 1983

DECLARATION OF
Steven R. Radis

I**, Steven R. Radis** declare as follows:

1. I am presently employed as a consultant to the California Energy Commission in the **Environmental Protection Office** of the **Energy Facilities Siting Division**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Waste Management**, for the **GWF Tracy Combined Cycle Power Plant Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: 6 Aug 09 Signed: Original signature in Dockets

At: Ventura, California

Steven R. Radis

Mr. Radis is a Principal with MRS. Before joining MRS, he was a Principal in Arthur D. Little, Inc.'s Environmental Health & Safety Practice located in the Santa Barbara and Ventura, California offices. His expertise includes meteorological modeling and analysis, physical oceanographic modeling and analysis, consequence and risk analysis, fire and explosion dynamics, hazard evaluation, external events analysis, fault tree analysis, and model development. Mr. Radis has worked on a wide variety of studies for utilities, commercial, and government clients involving meteorological modeling, quantitative risk assessments, health risk assessments, consequence analysis, risk management, air quality modeling (inert/photochemical pollutants, toxic air contaminants), and Environmental Impact Reports (EIR)/Statements (EIS) prepared in compliance with the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). His experience includes the following:

- Mr. Radis completed a safety and vulnerability analysis of the Diablo Canyon Power Plant (DCPP) and the San Onofre Nuclear Generating Station (SONGS) Steam Generator Replacement Projects for the California Public Utilities Commission. The EIR analyses evaluated a range of equipment and operational failure modes and quantitatively evaluated the associated radiological consequences of core damage accidents and releases. Failure modes, release mechanisms and consequences associated with terrorist attacks were also evaluated.
- For the County of San Luis Obispo, Mr. Radis completed a safety and vulnerability analysis of the Diablo Canyon Power Plant (DCPP) Independent Spent Fuel Storage Installation (ISFSI). The EIR analysis evaluated a range of equipment and operational failure modes and quantitatively evaluated the associated radiological consequences of spent fuel pool and dry cask storage accidental releases. Failure modes, release mechanisms and consequences associated with terrorist attacks were also evaluated.
- Mr. Radis was the project Manager and Public Safety coordinator for the Venoco Ellwood Marine Terminal Lease Renewal Project EIR that was recently prepared for the California State Lands Commission. This is the last marine oil terminal in Santa Barbara County and the continuing operation of the terminal is raising a lot of public opposition. Critical environmental issues include the increased risk of an accidental release of oil and its impact on marine and terrestrial water quality and biological resources, recreation, land use, and visual resources.
- Mr. Radis has participated on power plant siting projects before the California Energy Commission in a variety of roles. He is currently assisting the CEC on the GWF Tracy Combined Cycle Power Plant, City of Palmdale Hybrid Power Plant, Watson Cogeneration Steam and Electric Reliability, and the Kings River Conservation District Community Power Plant projects. Mr. Radis also participated as an intervener on the Metcalf Energy Center and Potrero Unit 7 siting cases. Mr. Radis has also represented applicants on the Occidental Elk Hills project, and several siting cases in the 1980's for Southern California Edison.
- Mr. Radis prepared two sections of the Plains All American Crude Oil Marine Terminal SEIS/EIR, the project that includes construction of a marine terminal on

Steven R. Radis (continued)

Pier 400 in the Port of Los Angeles. Marine Vessel Transportation and System Safety/Risk of Upset. The Marine Vessel Transportation analysis considers the specific type and number of vessels that currently visit the Port and pass by Pier 400, and evaluates the number and characteristics of tankers that would be calling at the new Pier 400 marine terminal after project implementation.

- For the California Coastal Commission, Mr. Radis provided technical assistance in the reviews of the BHP Billiton Liquefied Natural Gas (LNG) Cabrillo Port Project and the Port of Long Beach Sound Energy Solutions (SES) Long Beach LNG Project. The review of the proposed projects is focused on the adequacy and completeness of risk analysis, especially in terms of the safety review requirements of 49 CFR 193 Subpart B and NFPA Design Standard 59A. Mr. Radis is also acting as a technical advisor to CCC staff on risk analysis, vapor dispersion modeling, etc., as well as identifying deficiencies, if any, in the analysis or recommended mitigation measures. Mr. Radis is also currently providing technical assistance to the California Coastal Commission on the OceanWay and Clearwater LNG projects.
- Mr. Radis managed the preparation of an Environmental Impact Report for the Nacimiento Water Project. The EIR that evaluated environmental impacts associated with construction and operation of a 65-mile water pipeline and associated facilities in San Luis Obispo County. The pipeline would draw water from Nacimiento Reservoir and deliver it to various purveyors in the County. The pipeline would cross numerous jurisdictions and would affect a number of landowners and agencies. The proposed project included two equal options: (1) Raw Water Option that entailed construction of the pipeline and facilities that would deliver raw water to the purveyors; and (2) Treated Water Option that also entailed construction of a water treatment plant; in this case, potable water would be delivered to the purveyors. This EIR contained more than 800 pages, not including the Executive Summary and technical appendices. Over 140 mitigation measures were developed to lessen impacts from the proposed project.
- Mr. Radis was a Project Manager on the Point Pedernales Project Supplemental EIR that was prepared for Santa Barbara County. Mr. Radis was also the Principal Investigator for the Air Quality and Risk-of-Upset Project portions of the Supplemental EIR.
- Mr. Radis conducted system safety and reliability studies for several oil and gas projects for Santa Barbara County. These studies included hazard identification, external event and offsite consequence analyses. Facilities included oil and gas processing plants, offshore platforms, onshore production facilities, as well as sour gas and crude oil pipelines. Quantitative Risk Analyses (QRA) were prepared for several of the projects.
- As part of an EIR/EIS for the Unocal Avila Beach Cleanup Project, Mr. Radis served as the Project Manager for San Luis Obispo County, California Regional Water Quality Control Board, and the U.S. Army Corps of Engineers. The EIR/EIS included the evaluation of site contamination and a variety of cleanup strategies, including air

Steven R. Radis (continued)

sparging/bioventing, solidification/ stabilization, solvent flooding, steam stripping, excavation, and thermal desorption. Leaking Unocal Marine Terminal pipelines had resulted in approximately 400,000 gallons of petroleum hydrocarbon contamination beneath the town of Avila Beach and the adjacent beach and intertidal zone. San Luis Obispo County certified the EIR/EIS, and Mr. Radis assisted the Regional Water Quality Control Board in establishing cleanup levels for the site.

- For the Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers (AIChE), Mr. Radis co-authored a book entitled *Guidelines for Postrelease Mitigation Technology in the Chemical Process Industry*. As part of this effort, Mr. Radis quantitatively evaluated the effectiveness of a variety of hazardous chemical mitigation technologies.
- For a Texas-based law firm, Mr. Radis prepared an analysis of external events and provided expert testimony to the Texas Water Commission related to the safety of a hazardous waste disposal facility proposed for the Houston Ship Channel. This study included a review of past external events in the region and centered on hurricane, tornado, and storm surge hazards. The study required the development of a wind field model to simulate hurricanes passing over the site and to estimate potential maximum wind speeds and wind load on the proposed equipment, as well as projected changes in ship channel water levels.
- For a large Southern California utility, Mr. Radis evaluated the feasibility and system safety of converting a fuel oil pipeline distribution network into a regional crude oil and petroleum product storage and distribution system. An analysis of safety and environmental issues was prepared for the CPUC and the South Coast Air Quality Management District. Both agencies approved the conversion project, which is now operating at full capacity. An expansion of the pipeline system was evaluated to increase overall system pipeline throughput capacity, as well as to accommodate unit train and VLCC tanker deliveries.
- Mr. Radis has been involved in the preparation of EIR/EISs for a wide variety of facilities including power generating facilities (coal, fuel oil, natural gas, geothermal, hazardous waste), hazardous waste disposal facilities (chemical and nuclear), crude oil and natural gas transmission pipelines and distribution networks, oil and gas development projects, and military development or conversion projects. Mr. Radis has managed a majority of these projects and was also responsible for the system safety, public health, and air quality issue areas.
- For four Local Emergency Planning Committees (LEPCs) in Alaska, Mr. Radis developed emergency response planning procedures through the preparation of a comprehensive regional hazard and risk analysis.
- For a large engineering company, Mr. Radis prepared a quantitative risk assessment for a LNG marine terminal and power plant project in Puerto Rico. The project included conducting a hazard assessment, fault tree analysis, consequence analysis,

Steven R. Radis (continued)

and quantitative risk analysis. An analysis of external events that could potentially affect the proposed facility was also conducted.

- Mr. Radis has worked on the development of several models, including the development or revisions to several accidental release models, an oil spill model, a multi-component pool model, atmospheric diffusion models, an integrated human exposure and health risk assessment model, and several meteorological models.

Mr. Radis earned his M.A. and B.A degrees in Climatology from California State University, Northridge. He is a member of the American Meteorological Society, and the Air and Waste Management Association.

DECLARATION OF
SHAHAB KHOSHMASHRAB

I**, SHAHAB KHOSHMASHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Facilities Siting Division as a **MECHANICAL ENGINEER**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I participated in the preparation of the staff testimony on **Facility Design** for the **GWF Tracy Combined Cycle Power Plant** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: July 29, 2009 Signed: Original signature in Dockets

At: Sacramento, California

Shahab Khoshmashrab
Mechanical Engineer

Experience Summary

Nine years experience in the Mechanical, Civil, Structural, and Manufacturing Engineering fields involving engineering and manufacturing of various mechanical components and building structures. This experience includes QA/QC, construction/licensing of electric generating power plants, analysis of noise pollution, and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Sacramento-- Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California

Professional Experience

2001-2004--Mechanical Engineer, Systems Assessment and Facilities Siting– California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise and vibration, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

1998-2001--Structural Engineer – Rankin & Rankin

Engineered concrete foundations, structural steel and sheet metal of various building structures including energy related structures such as fuel islands. Performed energy analysis/calculations of such structures and produced structural engineering detail drawings.

1995-1998--Manufacturing Engineer – Carpenter Advanced Technologies

Managed manufacturing projects of various mechanical components used in high tech medical and engineering equipment. Directed fabrication and inspection of first articles. Wrote and implemented QA/QC procedures and occupational safety procedures. Conducted developmental research of the most advanced manufacturing machines and processes including writing of formal reports. Developed project cost analysis. Developed/improved manufacturing processes.

DECLARATION OF

Testimony of Patrick A. Pilling, Ph.D., P.E., G.E., D.GE.

I**, Patrick A. Pilling, Ph.D., P.E., G.E., D.GE.,** declare as follows:

1. I am presently employed as a subcontractor to Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as an engineering geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **GEOLOGY AND PALEONTOLOGY** for the proposed **GWF Tracy Combined Cycle Power Plant** project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: July 29, 2009 Signed: Original signature in Dockets

At: Black Eagle Consulting, Inc.
Reno, Nevada

PATRICK A. PILLING, Ph.D., P.E., G.E.

Executive Vice President
Principal Geotechnical Engineer

Education

$ B.S. B Civil Engineering B1986 B Santa Clara University
$ M.S. B Civil Engineering B 1991 B San Jose State University
$ Ph.D. B Civil Engineering B 1997 B University of Nevada, Reno

Registrations

- P.E. - Civil - Nevada – No. 9153
- P.E. - Civil – California – No. C 49578
- P.E. - Geotechnical – California – No. GE 2292
- P.E. - Civil - Oregon – No. 19675PE
- P.E. – Geotechnical – Oregon – No. 19675PE
- P.E. - Civil – Arizona – No. 35310
- P.E. - Civil – Utah – No. 971338-2202

Associated Experience

- University of Nevada, Reno - Course Instructor - CE 771 - Mining Waste Containment Design
- University of Nevada, Reno - Course Instructor - CE 771 - Practical Foundation Engineering

Experience

1997 to Present: Black Eagle Consulting, Inc.; Executive Vice President. Dr. Pilling maintains over 18 years of construction, geotechnical, transportation, and mining engineering experience, and has supervised the engineering and construction of such projects throughout the western United States and South America. As Executive Vice President, Dr. Pilling oversees daily office operations, including personnel and accounting issues, coordinates company marketing efforts, and performs project management, engineering and laboratory analyses, and report preparation on most projects. Dr. Pilling presently serves as our project manager of the Reno Retrack construction management team reviewing geotechnical design submittals for this rail project.

1996 to 1997: SEA, Incorporated; Senior Geotechnical Engineer. Dr. Pilling provided project coordination, management, supervision, and development, and performed field exploration, engineering analyses, and report preparation.

1990 to 1996: WESTEC; Project Manager. Mr. Pilling was responsible for general geotechnical analyses on most projects, as well as design, management, and permitting of heap leach and tailings storage facilities projects. His experience varied from foundation design recommendations for small pump house structures to detailed liquefaction and seepage/slope stability analyses for large earthen embankments.

1986 to 1990: Case Pacific Company; Project Manager. Mr. Pilling provided cost estimating, project management, and contract negotiation on a wide variety of projects. Responsibilities included design and

construction of drilled shafts, earth retention, and underpinning systems, in addition to construction scheduling and cost control.

Affiliations

- American Public Works Association
- American Concrete Institute: Concrete Field Testing Technician Grade I
- National Society of Professional Engineers
- Secretary/Treasurer - National Society of Professional Engineers, Northern Nevada Chapter
- American Society of Civil Engineers
- International Association of Foundation Drilling
- National Council of Examiners for Engineering and Surveying
- American Society of Engineering Education
- Deep Foundations Institute

Publications

Ashour, M., P. A. Pilling, G. M. Norris, and H. Perez, June 1996, ADevelopment of a Strain Wedge Model Program for Pile Group Interference and Pile Cap Contribution Effects,@ Report No. CCEER-94-4, University of Nevada, Reno; Federal Study No. F94TL16C, Submitted to State of California Department of Transportation (CalTrans).

Ashour, M., P. A. Pilling, and G. M. Norris, March 1997, ADocumentation of the Strain Wedge Model Program for Analyzing Laterally Loaded Isolated Piles and Pile Groups,@ Proceedings, 32nd Symposium on Engineering Geology and Geotechnical Engineering, Boise, Idaho, pp. 344-359.

Ashour, M., P. Pilling, and G. Norris, 1998, "Updated Documentation of the Strain Wedge Model Program for Analyzing Laterally Loaded Piles and Pile Groups," Proceedings, 33rd Engineering Geology and Geotechnical Engineering Symposium, University of Nevada, Reno, pp. 177-178.

Ashour, M., G. Norris, and P. Pilling, April 1998, ALateral Loading of a Pile in Layered Soil Using the Strain Wedge Model,@ Journal of Geotechnical and Geoenvironmental Engineering, ASCE, Vol. 124, No. 4, pp. 303-315.

Ashour, M., G. M. Norris, S. Bowman, H. Beeston, P. Pilling, and A. Shamsabadi, March 2001, "Modeling Pile Lateral Response in Weathered Rock," Proceeding 36th Engineering Geology and Geotechnical Engineering Symposium, University of Nevada, Las Vegas, 2001.

Ashour, M., G. Norris, and P. Pilling, July/August 2002, "Strain Wedge Model Capability of Analyzing the Behavior of Laterally Loaded Isolated Piles, Drilled Shafts, and Pile Groups," Journal of Bridge Engineering, ASCE, Vol. 7, No 4, pp. 245-354.

Ashour, M., P. Pilling, and G. M. Norris, March 26 – 31, 2001, "Assessment of Pile Group Response Under Lateral Load," Proceedings, 4th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, University of Missouri – Rolla, MO, Paper 6.11.

Norris, G. M., M. Ashour, P. A. Pilling, and P. Gowda, March 1995, AThe Non-Uniqueness of p-y Curves for Laterally Loaded Pile Analysis,@ Proceedings, 31st Symposium on Engineering Geology and Geotechnical Engineering, Logan, Utah, pp. 40-53.

Norris, G. M., P. K. Gowda, and P. A. Pilling, February 1993, AStrain Wedge Model Formulation for Piles,@ Report No. CIS 91-11, University of Nevada, Reno.

Pilling, P. A., 1997, AThe Response of a Group of Flexible Piles and the Associated Pile Cap to Lateral Loading as Characterized by the Strain Wedge Model,@ Doctoral Dissertation, University of Nevada, Reno.

Pilling, P. A. and P. V. Woodward, March 1995, ADependent Facility Closure in California,@ Proceedings, Mine Closure: Creating Productive Public and Private Assets, Sparks, Nevada, pp. 315-326.

Pilling, P.A. and H. E. Beeston, March 1998, AExpansion Testing of Clay Soils in Forensic Investigations,@ Proceedings, 33rd Symposium on Engineering Geology and Geotechnical Engineering, Reno, Nevada, pp. 119-127.

Pilling, P.A., M. Ashour, and G.M. Norris, 2001, "Strain Wedge Model Hybrid Analysis of a Laterally Loaded Pile Group," Journal of the Transportation Research Board, Transportation Research Record No. 1772, Paper No. 01-0174, pp. 115-121.

Pilling, P.A., July 2002, "Assessing the Liquefaction Potential of Sand Deposits Containing an Appreciable Amount of Gravel," Program with Abstracts 2002 Annual Meeting Association of Engineering Geologists and American Institute of Professional Geologists, Reno, Nevada, p35.

Awards

- Hugh B. Williams Industry Advancement Scholarship, International Association of Foundation Drilling (ADSC), 1993-94.

- National Society of Professional Engineers, Northern Nevada Chapter, Young Engineer of the Year, 1996.

DECLARATION OF
Erin Bright

I**, Erin Bright,** declare as follows:

1. I am presently employed by the California Energy Commission in the **Engineering Office** of the Siting Transmission and Environmental Protection Division as a **Mechanical Engineer**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Power Plant Efficiency** and **Power Plant Reliability** for the **GWF Tracy Combined Cycle Project** based on my independent analysis of the Application, supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: August 25, 2009 Signed: Original signature in Dockets

At: Sacramento, California

Erin Bright
Mechanical Engineer

Experience Summary

One year of experience in the electric power generation field, including analysis of noise pollution, construction/licensing of electric generating power plants, and engineering and policy analysis of thermal power plant regulatory issues. One year of experience in the alternative energy field, including analysis of alternative fuel production and use.

Education

- University of California, Davis--Bachelor of Science, Mechanical Engineering and Materials Science
- University of California, Davis Extension Program--Renewable Energy Systems

Professional Experience

2007 to Present-- Mechanical Engineer, Energy Facilities Siting Division - California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

2006 to 2007--Energy Analyst, Fuels & Transportation Division - California Energy Commission

Performed analysis of use potential and environmental effects of emerging non-petroleum fuels, including compressed natural gas, biomass, hydrogen and electricity, in heavy and light duty transportation vehicles. Contributor to Energy Commission's alternative fuels plan.

DECLARATION OF
AJOY GUHA

I**, Ajoy Guha,** declare as follows:

1. I am presently employed by the California Energy Commission in the **Transmission System Engineering unit** of the Siting, Transmission and Environmental Protection Division as an Associate Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transmission System Engineering**, for the **GWF Tracy Combined Cycle Power Plant Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: 8-10-09 Signed: Original signature in Dockets

At: Sacramento, California

RESUME

AJOY GUHA

Associate Electrical Engineer
California Energy Commission
1516 Ninth Street, MS 46
Sacramento, CA 95814

EDUCATION:

MSEE, POWER SYSTEMS ENGINEERING, PURDUE UNIVERSITY, INDIANA
BSEE, ELECTRICAL ENGINEERING, CALCUTTA UNIVERSITY, INDIA

CERTIFICATIONS:

REGISTERED PROFESSIONAL ENGINEER, CALIFORNIA, INDIANA & ILLIINOIS
MEMBER OF IEEE; MEMBER OF THE INSTITUTION OF ENGINEERS OF INDIA

SUMMARY OF PROFESSIONAL BACKGROUND:

Ajoy Guha, P. E. has 34 years of electric utility experience with an extensive background in evaluating and determining current and potential transmission system reliability problems and their cost effective solutions. He has a good understanding of the transmission issues and concerns. He is proficient in utilizing computer models of electrical systems in performing power flow, dynamic stability and short circuit studies, and provide system evaluations and solutions, and had performed generator interconnection studies, area transfer and interconnected transmission studies, and prepared five year transmission alternate plans and annual operating plans. He is also experienced in utilizing Integrated Resource Planning computer models for generation production costing and long term resource plans, and had worked as an Executive in electric utilities and experienced in construction, operation, maintenance and standardization of transmission and distribution lines.

WORK EXPERIENCE:

CALIFORNIA ENERGY COMMISSION, ENERGY FACLITIES SITING AND ENVIRONMENTAL DIVISION, SACRAMENTO, CA, 11/2000-Present.
Working as Associate Electrical Engineer in the Transmission System Engineering unit on licensing generation projects. Work involves evaluating generation interconnection studies and their impacts on transmission system, and providing staff assessments and testimony to the commission, and coordination with utilities and other agencies.

ALLIANT ENERGY, DELIVERY SYSTEM PLANNING, MADISON, WI, 4/2000-9/2000.
Worked as Transmission Services Engineer, performed Generator Interconnection studies and system planning studies.

IMPERIAL IRRIGATION DISTRICT, POWER DEPT., Imperial, California, 1985-1998.
Worked as Senior Planning Engineer in a supervisory position and in Transmission, Distribution and Integrated Resource planning areas. Performed interconnection studies for 500 MW geothermal plants and developed plan for a collector system, developed methodologies for transmission service charges , scheduling fees and losses. Worked as the Project Leader in the 1992 Electricity Report (ER 92) process of the California Energy Commission. Worked as the Project Leader for installation of an engineering computer system and softwares. Assumed the Project Lead in the standardization of construction and materials, and published construction standards.

CITY LIGHT & POWER, Frankfort, Indiana, 1980 – 1985.
Worked as Assistant Superintendent and managed engineering, construction and operation depts.

WESTERN ILLINOIS POWER CO-OP., Jacksonville, Illinois, 1978 – 1980.
Worked as Planning Engineer and was involved in transmission system planning.

THE CALCUTTA ELECTRIC SUPPLY CORPORATION LTD. (CESC), Calcutta, India, 1964 –1978.
Worked as District Engineer and was responsible for managing customer relations, purchasing and stores, system planning, construction, operation and maintenance departments of the most industrialized Transmission and Distribution division of the Utility. Worked as PROJECT MANAGER for construction of a 30 mile Double Circuit 132 kV gas-filled Underground Cable urban project. During 1961-63, worked as Factory Engineer for design, manufacturing and testing of transformers, motor starters and worked in a coal-fired generating plant.

DECLARATION OF
Mark Hesters

I**, Mark Hesters,** declare as follows:

1. I am presently employed by the California Energy Commission in the **Transmission System Engineering unit** of the Siting, Transmission and Environmental Protection Division as a Senior Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transmission System Engineering**, for the **GWF Tracy Combined Cycle Power Plant Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: 9/28/09 Signed: Original signature in Dockets

At: Sacramento, California

Mark Hesters
Associate Electrical Engineer

Mark Hesters has sixteen years of experience in electric power regulation. He worked in the Engineering Office of the California Energy Commission's Energy Facilities Siting & Environmental Protection Division since 1998 providing analysis of California transmission systems and testimony on transmission systems in several Commission power plant certification processes. Prior to that Mark worked in the CEC's Electricity Analysis Office providing lead analysis on Southern California Edison resource issues and modeling support for all areas of California. He holds a B.S. degree from the University of California at Davis in Environmental Policy Analysis and Planning.

DECLARATION OF
ANGELIQUE JUAREZ-GARCIA

I, Angelique Juarez-Garcia, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a Compliance Project Manager.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the Compliance General Conditions and Closure Plan section for the GWF Tracy Combined Cycle Power Plant Project Final Staff Assessment based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

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

Dated: 7/29/09 Signed: Original signature in Dockets

At: Sacramento, California

ANGELIQUE JUAREZ-GARCIA

Planner I

RELATED EXPERIENCE SUMMARY

Angelique Juarez-Garcia has nine years of experience in utilities project management. She has worked in telephone outside plant engineering and construction from 1999 to 2008 overseeing engineering, GIS, forecasting, and joint utility projects. Angelique now works in the Energy Commission's Compliance Unit of the Siting, Transmission & Environmental Protection Division.

EXPERIENCE

July 2008 -Present Compliance Project Manager – California Energy Commission
Siting, Transmission & Environmental Protection Division

California Energy Commission, Planner I
Direct technical staff in tasks related to power plant project design, construction, operation, and associated environmental issues. Negotiate agreements between power plant operators, public agencies, and community groups. Consult with engineering, legal and technical staff to identify and resolve technical issues. Current construction and operational projects include: Los Esteros 2 Power Plant, Morro Bay Modernization & Replacement Power Plant Project, San Francisco Electric Reliability Project, Delta Energy Center, Los Medanos Energy Center, NCPA 2& 3, Tracy Peaker, and SMUD Cosumnes.

January 2004 -July 2008 OSP Engineer
AT&T via contracting firms NorthStar, Byers Engineer, Randstad and TNMG

Partnered with electrical utility companies for joint facility siting. Cost estimated utility projects for 3rd party contractor on behalf of SBC. Trained team of on and off site engineers to meet SBC standards. Planned and forecasted utility growth to new and existing neighborhoods. Collaborated with government agencies to obtain Right of Way and encroachment permits. Coordinated with clients to develop project guidelines that meet CPUC tariffs.

November 1999 -December 2003 Single Point of Contact and Outside Plant Engineer
SBC/AT&T, 1999-2003

Engineered and cost estimated utility projects for my designated wire centers. Coordinated the path of utilities with electric companies and other utilities. Analyzed demand and consumption trends to develop strategic and cost efficient construction plans. Partnered with customers to obtain property right-of-ways. Coordinated with Federal, State, County and City officials to obtain building, street crossing and encroachment permits. Evaluated construction overages & created a program for better cost forecasting.

Education: Master of Science Degree, 2002
Management of Technology, Golden Gate University

Bachelor of Arts Degree, 1997
Economics, UC Santa Cruz

Certificate of Paralegal Studies, 1991
Barclay College

Related Training: Graduate Level Project Management Course at Golden Gate University
AT&T's Eight Week Outside Plant Training Course
Environmental Business Upper Division Course at UC Santa Cruz
Basic CEQA 3 Day Workshop

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE *GWF TRACY COMBINED CYCLE POWER PLANT PROJECT*

Docket No. 08-AFC-7
PROOF OF SERVICE

(Revised 2/25/2009)

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DECLARATION OF SERVICE

I, April Albright, declare that on October 30, 2009, I served and filed copies of the attached GWF Tracy Combined Cycle Power Plant Project Final Staff Assessment. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[http://www.energy.ca.gov/sitingcases/tracyexpansion/index.html]**. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(C*heck all that Apply*)

For service to all other parties:

__✓__ sent electronically to all email addresses on the Proof of Service list;

__✓__ by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

For filing with the Energy Commission:

__✓__ **sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (preferred method);**

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-7
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Original signed by
April Albright